STEREO INTEGRATED AMPLIFIER

KA-990EX

SERVICE MANUAL

KENWOOD

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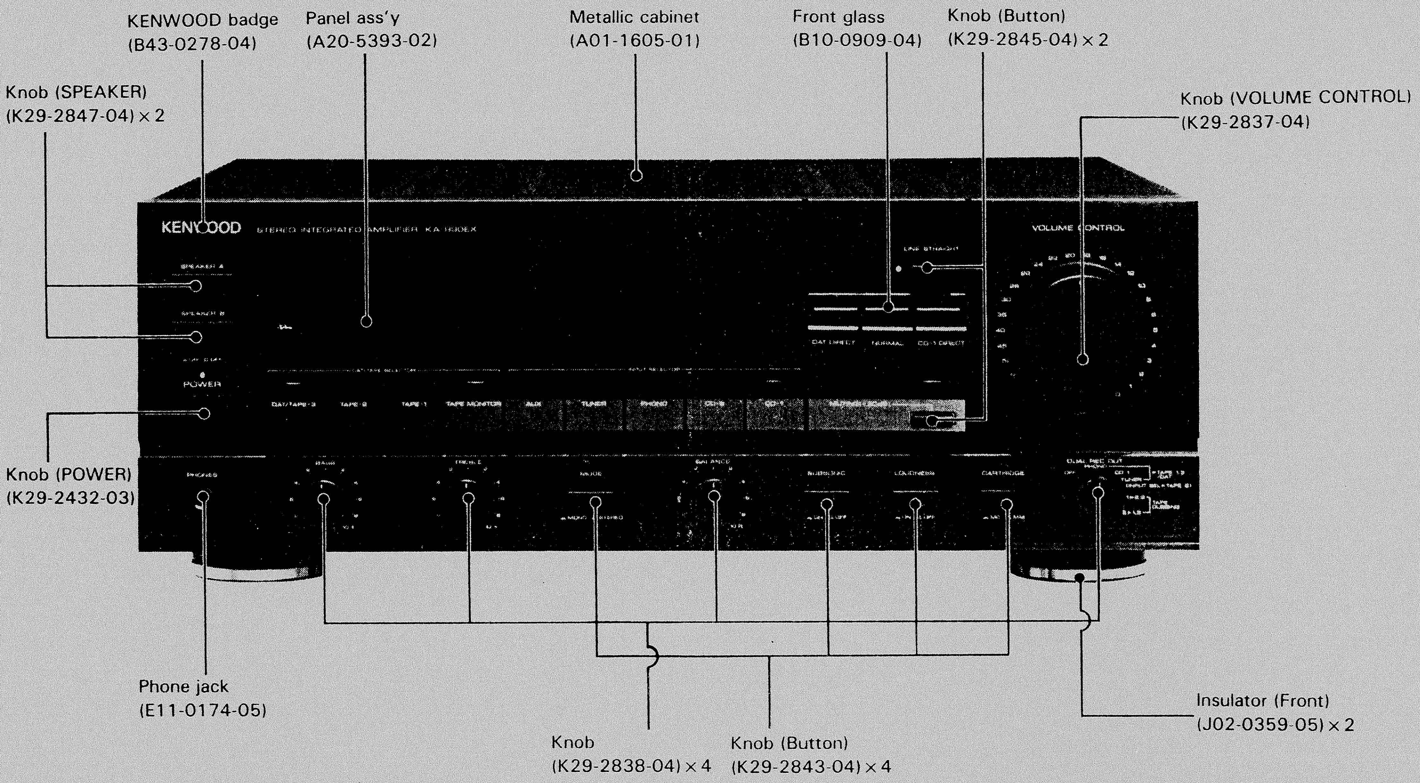
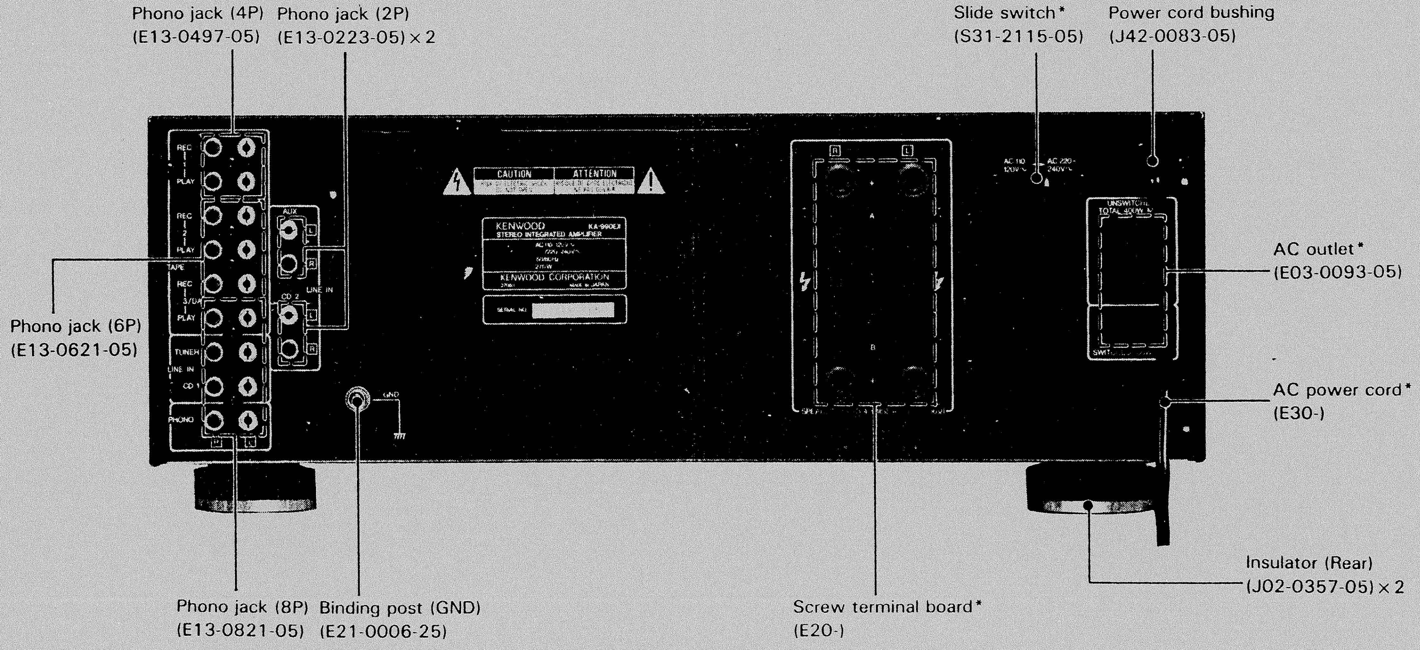
B51-3419-00(T)1681


KENWOOD badge
(B43-0278-04)
Panel ass'y
(A20-5393-02)
Metallic cabinet
(A01-1605-01)
Front glass
(B10-0909-04)
Knob (Button)
(K29-2845-04) × 2
Knob (SPEAKER)
(K29-2847-04) × 2
Knob (VOLUME CONTROL)
(K29-2837-04)
KENWOOD
VOLUME CONTROL
POWER
Knob (POWER)
(K29-2432-03)
Phone jack
(E11-0174-05)
Insulator (Front)
(J02-0359-05) × 2
Knob
(K29-2838-04) × 4
Knob (Button)
(K29-2843-04) × 4


Phono jack (4P)
(E13-0497-05)
Phono jack (2P)
(E13-0223-05) × 2
Slide switch*
(S31-2115-05)
Power cord bushing
(J42-0083-05)
CAUTION
ATTENTION
KENWOOD
KENWOOD CORPORATION
AC outlet*
(E03-0093-05)
Phono jack (6P)
(E13-0621-05)
AC power cord*
(E30-)
Insulator (Rear)
(J02-0357-05) × 2
Phono jack (8P)
(E13-0821-05)
Binding post (GND)
(E21-0006-25)
Screw terminal board*
(E20-)

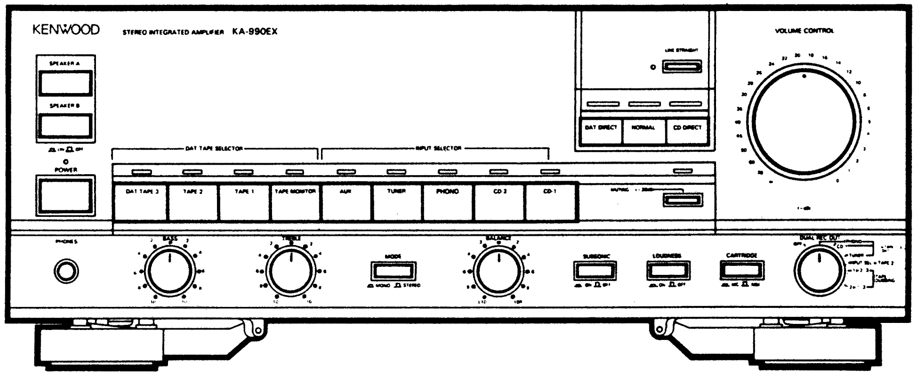
*** Refer to Parts List on page 29.**

CONTENTS

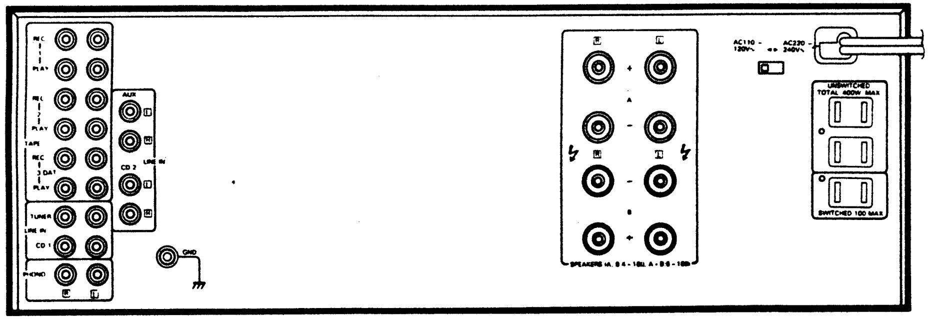
PANEL DISPLAY 2
DISASSEMBLY FOR REPAIR 3
BLOCK & LEVEL DIAGRAM 6
CIRCUIT DESCRIPTION 7
ADJUSTMENT/REGRAGES/ABGLEICH 9
VOLTAGE TABLES 10
PC BOARD (Component side view) 11
PC BOARD (Foil side view) 15
CIRCUIT DIAGRAM 19
EXPLODED VIEW 27
PARTS LIST 29
SPECIFICATIONS .... Back cover

PANEL DISPLAY

Front panel


KENWOOD
STEREO INTEGRATED AMPLIFIER KA-990EX
VOLUME CONTROL
SPEAKER A
SPEAKER B
POWER
LINE STRAIGHT
DAT DIRECT
NORMAL
CD DIRECT
DAT TAPE SELECTOR
INPUT SELECTOR
DAT TAPE 3
TAPE 2
TAPE 1
TAPE MONITOR
AUX
TUNER
PHONO
CD 2
CD 1
MUTING
PHONES
BASS
TREBLE
MODE
BALANCE
SUBSONIC
LOUDNESS
CARTRIDGE
DUAL REC OUT

Rear panel

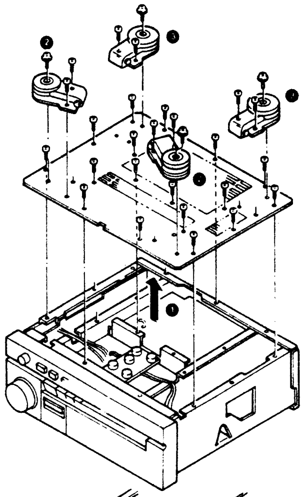

REC
PLAY
TAPE
DAT
AUX
CD 2
LINE IN
TUNER
CD 1
PHONO
GND
AC110-120V~
AC220-240V~
UNSWITCHED TOTAL 400W MAX
SWITCHED 100W MAX
SPEAKERS

DISASSEMBLY FOR REPAIR

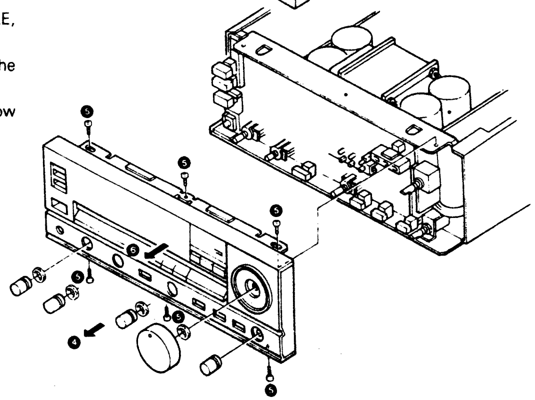
Disassembling procedure for repair

(Remove the metallic cabinet from the body beforehand.)

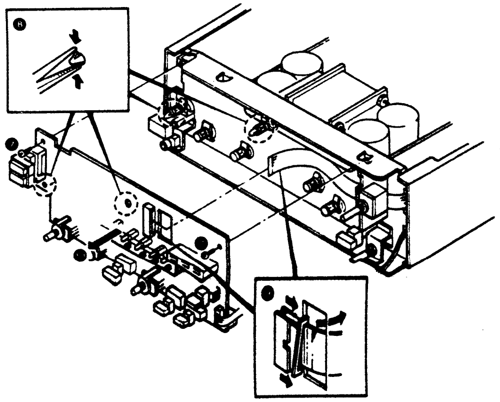
1. Remove the 17 screws holding the bottom plate, and remove the bottom plate (❶).
2. When removing the two insulators (J02-0359-05) at the front side, remove the three screws for each (❷).
3. When removing the two insulators (J02-0357-05) at the rear, remove the three screws for each (❸).



4. Remove the knobs and nuts for the BASS, TREBLE, BALANCE, DUAL REC OUT and VOLUME VRs (❹).
5. Remove the six screws (three at the top, and three at the bottom) retaining the panel ass'y to the frame (❺).
6. Remove the panel ass'y in the direction of the arrow (❻).

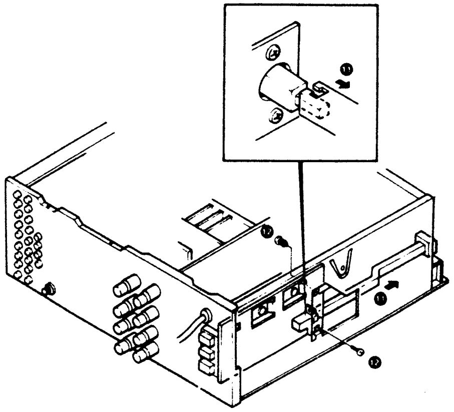


7. Remove the two screws retaining the Tone Unit (X11-2470-00) to the frame (❼).
8. Remove the two unit holders retaining the Tone Unit (X11-) (❽).
9. Remove the flexible cord from the CN7 of the Tone Unit (X11-) as shown in the figure (❾).
10. Remove the Tone Unit (X11-) in the direction of the arrow (❿).

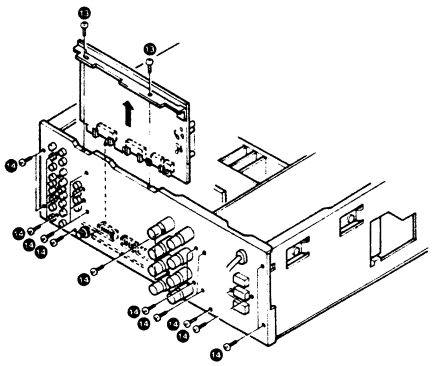


DISASSEMBLY FOR REPAIR

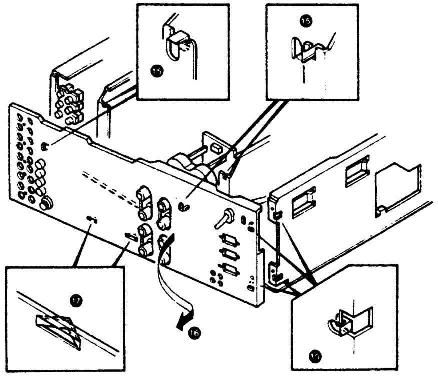
11. After confirming that the POWER switch is set to OFF, remove the shaft as shown in the figure (⑪).
12. Remove the screw and disengage the push-rivet fixing the Preamplifier Unit (X08-2232-71) (C/5) (⑫); the PC board is freed.



13. Remove the two screws retaining the Power Amplifier Unit (X07-2392-72) to the rear panel (⑬), and pull out the Power Amplifier Unit from the Audio Unit (X09-2562-71) (A/3).
14. Remove the 23 screws retaining the rear panel (⑭).



15. Taking cautious of the four lugs at the rear panel (⑮), remove the rear panel in the direction of the arrow (⑯).
16. When installing the rear panel to the body, carefully place the Audio Unit (X09-) (A/3) on the two lugs at the bottom of the rear panel (⑰).

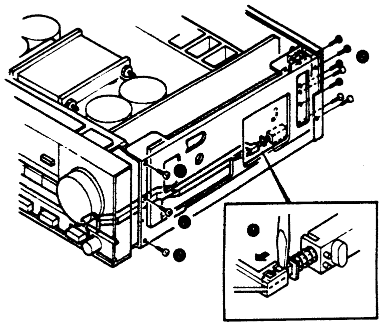


DISASSEMBLY FOR REPAIR

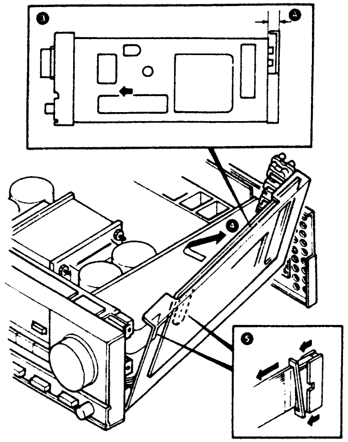
Removing the right side PC board

(Remove the metallic cabinet and bottom plate beforehand.)

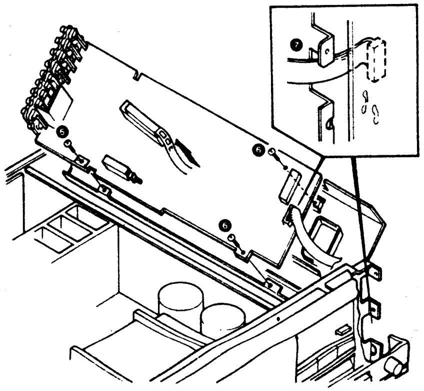
1. After setting the CARTRIDGE switch to the "MM" position, remove the shaft as shown in the figure (①).
2. Remove the six screws retaining the rear panel, and the three screws retaining the side frames (②).



3. Slide the right side frame to that which the Preamplifier Unit (X08-) (A/5) is attached so that there is a clearance at section A (③).
4. Lift the side frame diagonally in the direction of the arrow from the rear (④).
5. Remove the flexible cord from CN3 of the Preamplifier Unit (X08-) (A/5) (⑤).

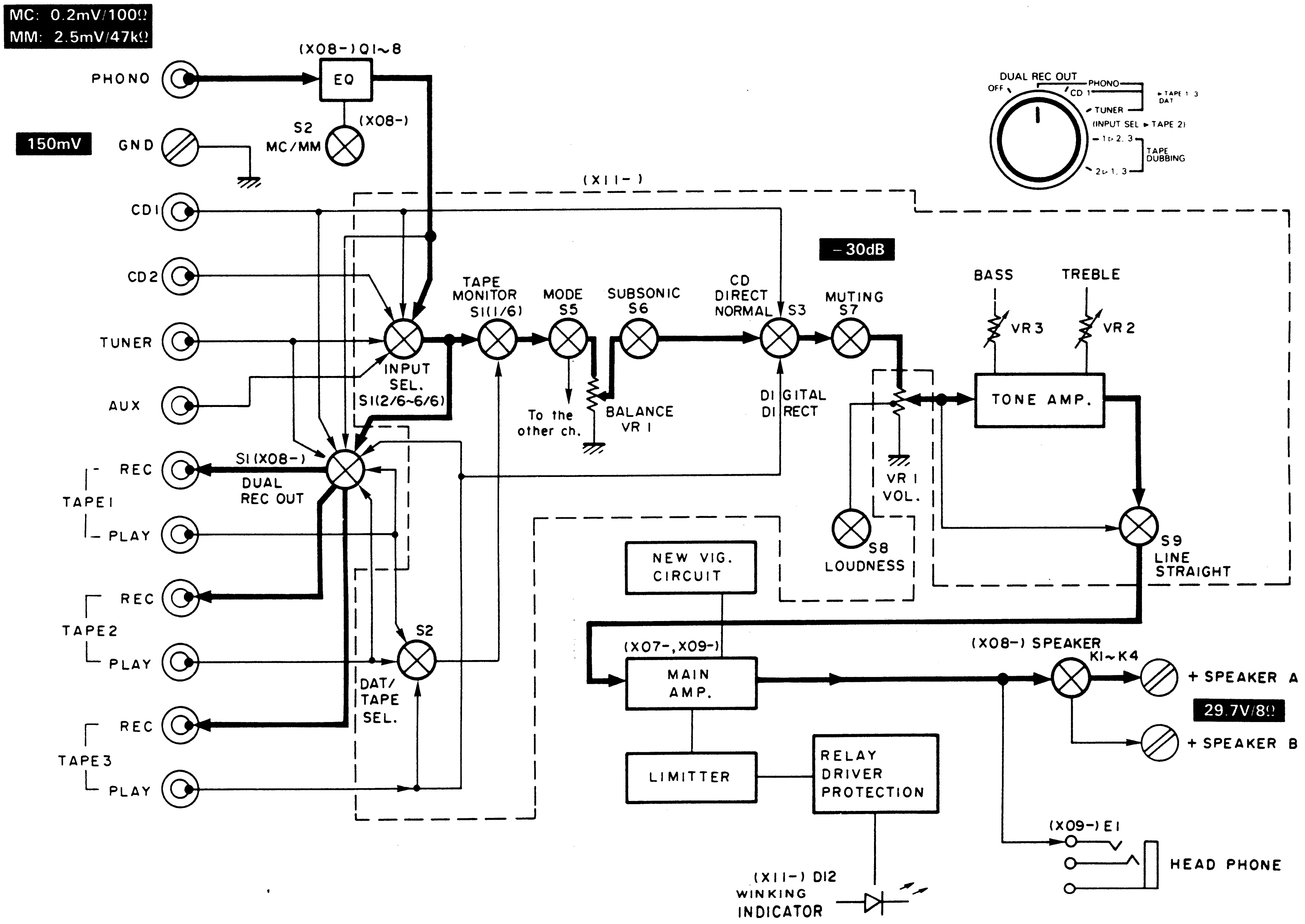


6. Remove the three screws retaining the Preamplifier Unit (X08-) (A/5) to the side frame (⑥), and remove it in the direction of the arrow.
7. When installing the Preamplifier Unit (X08-) (A/5), first pass the flexible cord through the notch of the front frame so as not to get in the way of the front frame (⑦).



KA-990EX

BLOCK & LEVEL DIAGRAM


MC: 0.2mV/100Ω
MM: 2.5mV/47kΩ
150mV
PHONO
GND
CD1
CD2
TUNER
AUX
TAPE1
REC
PLAY
TAPE2
REC
PLAY
TAPE3
REC
PLAY
(X08-) Q1~8
EQ
S2
MC/MM
(X08-)
(X11-)
INPUT
SEL.
S1(2/6~6/6)
S1(X08-)
DUAL
REC OUT
S2
DAT/
TAPE
SEL.
TAPE
MONITOR
S1(1/6)
MODE
S5
To the
other ch.
SUBSONIC
S6
BALANCE
VR 1
CD
DIRECT
NORMAL
S3
DIGITAL
DIRECT
-30dB
MUTING
S7
VR 1
VOL.
S8
LOUDNESS
BASS
VR 3
TREBLE
VR 2
TONE AMP.
S9
LINE
STRAIGHT
NEW VIG.
CIRCUIT
(X07-, X09-)
MAIN
AMP.
LIMITTER
RELAY
DRIVER
PROTECTION
(X11-) D12
WINKING
INDICATOR
(X08-) SPEAKER
K1~K4
+ SPEAKER A
29.7V/8Ω
+ SPEAKER B
(X09-) E1
HEAD PHONE
DUAL REC OUT
OFF
PHONO
CD 1
TUNER
▸ TAPE 1 3
DAT
(INPUT SEL ▸ TAPE 2)
1▹2, 3
2▹1, 3
TAPE
DUBBING

CIRCUIT DESCRIPTION

Function of components

Power amplifier unit (X07-2392-72)

Device	Use and function	Operation, condition and compatibility
IC1 (μPC1237HA)	Protection IC	
Q1, 2	Class A 1st-stage differential amp	
Q3 ~ 6	Class A 1st-stage cascode circuit	
Q7, 8	Constant-current circuit	Constant-current regulated circuit for the Class A 1st-stage differential amp.
Q9 ~ 12	Class A 2nd-stage differential amp	
Q13, 14	Class A cascode circuit	
Q15 ~ 18	Class A 3rd-stage differential amp	
Q19, 20	Class A current mirror circuit	
Q23 ~ 30	Cascode bootstrap circuit	VIG circuit components. Q23 to Q26 form a constant-current circuit and Q27 to Q30 form the base grounding circuit.
Q31 ~ 34	Predriver	
Q35 ~ 38	Driver	
Q39 ~ 42	Cascode bootstrap circuit	VIG circuit components. Q39 to Q42 form the buffer.
Q43 ~ 46	Current limiter	Limits the current to the final Tr during overload drive.
Q71	Constant-voltage circuit	Transmits the current limiter Q43 and Q44 operation signal to the protection IC (IC1).

Pre-amplifier unit (X08-2232-71)

Device	Use and function	Operation, condition and compatibility
IC1 (NJM5532D)	EQ circuit opamp	
IC2 (M5218P)	EQ circuit regulated power supply opamp	
Q1 ~ 4	EQ circuit 1st-stage differential amp	
Q5 ~ 8	EQ circuit 1st-stage cascode circuit	
Q9, 10	EQ circuit 1st-stage constant-current circuit	
Q11, 12	Regulated current supply	
Q14, 15	Relay control	

Audio unit (X09-2562-72)

Device	Use and function	Operation, condition and compatibility
IC1, 2 (KAB01)	Power IC	
IC3, 4 (TA2030)	DLD switch IC	DLD High/Low switching circuit.
Q1 ~ 6	Constant-voltage circuit	Constant-voltage supply circuit for main Class A stage.
Q7, 8	Constant-current circuit	Ripple elimination circuit inserted in the B line toward Class A 1st stage.
Q9	Relay driver	

Tone unit (X11-2470-00)

Device	Use and function	Operation, condition and compatibility
IC1 (NJM2041D-D)	Tone circuit IC	
Q1, 2	Winking circuit	The LED lights steadily when the power indicator and set are operating normally, and the LED blinks in the period between power ON and start of normal amp operation (for approx. 5 sec.) and during the protection circuit operation due to power amp failure.
Q3	Lamp flashing prevention circuit	Constant-voltage circuit to prevent the lamp from flashing when the power is output.

Various operations provided by the combination of DUAL REC OUT and INPUT SELECTOR switches

The functions of the TAPE REC jacks of this unit are basically different for jack 1 and jacks 2 and 3/DAT.
Basically, REC 2 jacks output the signal from the source selected by the INPUT SELECTOR switches, and REC 1 and REC 3/DAT jacks output signals from the source selected by the DUAL REC OUT switch. The following table shows the outputs provided by different settings of the switches.

DAT/TAPE REC Jacks / DUAL REC OUT SW Position	REC 1	REC 2	REC 3
PHONO → TAPE 1, 3 (INPUT ⊳ TAPE 2)	PHONO	SOURCE*	PHONO
CD1 → TAPE 1, 3 (INPUT ⊳ TAPE 2)	CD 1	SOURCE*	CD 1
TUNER → TAPE 1, 3 (INPUT ⊳ TAPE 2)	TUNER	SOURCE*	TUNER
TAPE 1 → 2, 3	SOURCE*	TAPE 1	TAPE 1
TAPE 2 → 1, 3	TAPE 2	SOURCE*	TAPE 2

Note:
"SOURCE" refers to the source selected by the INPUT SELECTOR switches (PHONO, CD-1, CD-2, TUNER or AUX).

ADJUSTMENT/REGLAGES/ABGLEICH

Adjustment

No.	ITEM	INPUT SETTINGS	OUTPUT SETTINGS	AMPLIFIER SETTINGS	ALIGNMENT POINTS	ALIGN FOR	FIG.
1	IDLE CURRENT	–	Connect a DC voltmeter across CP1 (L) CP2 (R). (X09-)	VOLUME: 0	VR1 (L) VR2 (R) (X07-)	9mV	(a)

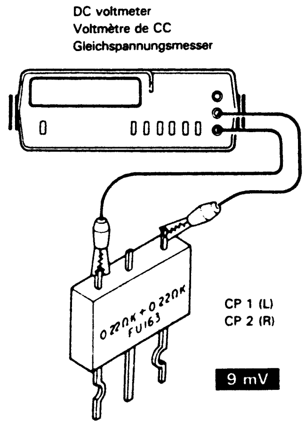
Reglages

N°	ITEM	REGLAGE DE L'ENTREE	REGLAGE DE LA SORTIE	REGLAGE DE L'AMPLIFICATEUR	POINT L'ALIGNEMENT	ALIGNER POUR	
1	COURANT DE POLARISATION	–	Connecter un voltmètre de CC sur CP1 (G) CP2 (D). (X09-)	VOLUME: 0	VR1 (G) VR2 (D) (X07-)	9mV	(a)

Abgleich

NR.	GEGENSTAND	EINGANGS-EINSTELLUNG	AUSGANGS-EINSTELLUNG	VERSTÄRKER EINSTELLUNG	ABGLEICH-PUNKTE	ABGLEICHEN FÜR	ABB.
1	LEERLAUFSTROM	–	Einen Gleichspannungsmesser über CP1 (L) CP2 (R) anschließen. (X09-)	VOLUME: 0	VR1 (L) VR2 (R) (X07-)	9mV	(a)

(a)



KA-990EX

VOLTAGE TABLES

(X07-239X-XX)

Q1

G1	–
D1	4.9V
S1	0.4V
G2	–
D2	0.4V
S2	4.9V

Q2

G1	–
D1	0.4V
S1	–
G2	–
D2	–
S2	0.4V

Q3

B	5.5V
C	11V
E	4.9V

Q5

B	5.5V
C	11V
E	4.9V

Q7

B	−14.5V
C	−5.9V
E	−15.2V

Q8

B	−14.5V
C	−5.9V
E	−15.2V

Q9

B	11V
C	−47.8V
E	11.5V

Q10

B	–
C	–
E	11.5V

Q11

B	11V
C	−47.8V
E	11.5V

Q12

B	–
C	–
E	11.5V

Q13

B	–
C	47.9V
E	–

Q14

B	–
C	47.9V
E	–

Q15

B	−47.9V
C	–
E	−48.5V

Q17

B	−48V
C	−1.8V
E	−48.5V

Q19

B	47.9V
C	1.8V
E	48.5V

Q20

B	47.9V
C	–
E	48.5V

Q23

B	62.0V
C	7.4V
E	62.6V

Q26

B	–
C	–
E	−63.4V

Q27

B	7.4V
C	63.3V
E	6.8V

Q28

B	–
C	63.3V
E	

Q29

B	−7.4V
C	63.4V
E	−6.9V

Q30

B	
C	−63.4V
E	

Q31

B	1.8V
C	6.8V
E	1.2V

Q33

B	−1.8V
C	−6.9V
E	−1.2V

Q35

B	
C	
E	0.6V

Q37

B	−1.2V
C	−6.9V
E	0.6V

Q39

B	0.6V
C	0V
E	1.2V

Q41

B	−0.6V
C	0V
E	−1.2V

Q45

B	
C	
E	0V

Q71

B	
C	
E	63.3V

(X08-223X-XX)(A/5)

Q11

B	20.5V
C	28.1V
E	19.4V

Q12

B	20.5V
C	28.5V
E	20V

IC1

4	19.4V
8	20V

IC2

8	28.5V

(X09-256X-XX)(A/3)

Q1

B	50.4V
C	63.3V
E	49.8V

Q2

B	50.4V
C	63.3V
E	49.8V

Q3

B	8.7V
C	50.4V
E	8.1V

Q4

B	
C	63.4V
E	50V

Q5

B	50.5V
C	63.4V
E	49.9V

Q6

B	0.5V
C	50.5V
E	–

Q7

B	
C	22.8V
E	42V

Q8

B	
C	20.3V
E	42.1V

Q9

B	34.3V
C	34.6V
E	34.8V

IC1

1	0.4V
2	1.24V
3	1.8V
4	0.8V
6	0.6V
8	63.8V
10	0V
11	0V
13	0V
14	0V
15	34.6V
17	34.8V
18	34.3V
19	0.6V
21	0.8V

IC2

1	0.4V
2	1.24V
3	−1.8V
4	0.8V
6	0.6V
8	63.8V
10	0V
11	0V
13	0V
14	0V
15	34.5V
17	34.8V
19	0.6V
21	0.8V

IC3

1	−0.6V
2	−0.6V
3	0.8V
4	−64V
6	−35V
7	0V
9	0V
10	0V
11	34.8V
12	−25.4V
13	63.8V
14	−0.8V
15	0.6V

IC4

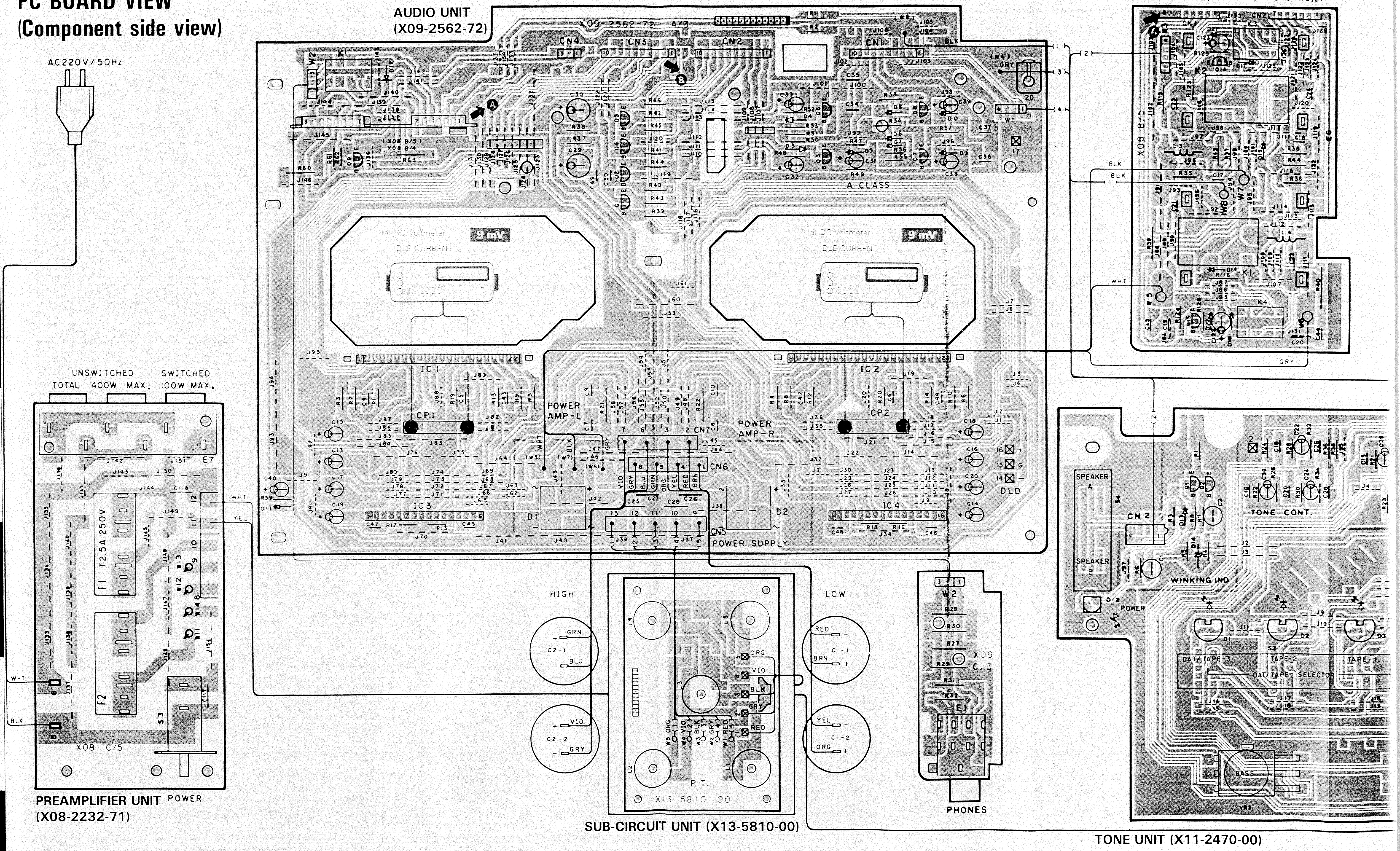
2	−0.6V
3	0.8V
4	−64V
6	−35V
7	0V
10	0V
11	34.8V
13	63.8V
14	0.8V
15	0.6V

(X11-247X-XX)

IC1

4	−15.3V
8	15.4V

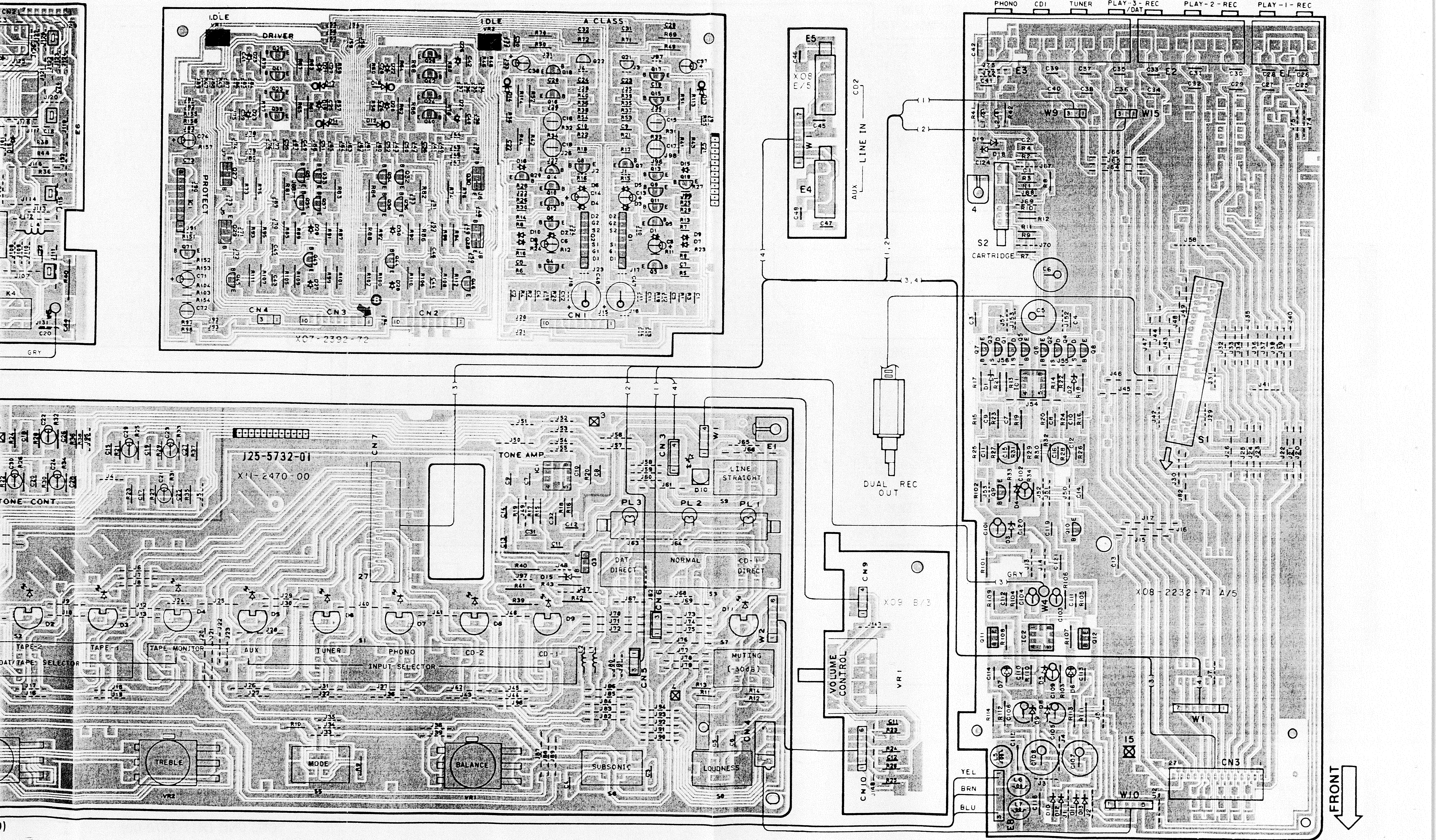
PC BOARD VIEW
(Component side view)


AC220V/50Hz
AUDIO UNIT
(X09-2562-72)
X09-2562-72
CN4
CN3
CN2
CN1
A CLASS
(a) DC voltmeter
IDLE CURRENT
9 mV
IC1
IC2
IC3
IC4
CP1
CP2
POWER AMP-L
POWER AMP-R
CN7
CN6
CN5
POWER SUPPLY
D1
D2
DLD
UNSWITCHED
TOTAL 400W MAX.
SWITCHED
100W MAX.
F1 T2.5A 250V
F2
S3
X08 C/5
E7
WHT
BLK
YEL
GRY
PREAMPLIFIER UNIT POWER
(X08-2232-71)
HIGH
LOW
C2-1
C2-2
C1-1
C1-2
GRN
BLU
VIO
RED
BRN
ORG
P.T.
X13-5810-00
SUB-CIRCUIT UNIT (X13-5810-00)
W2
X09 C/3
PHONES
PREAMPLIFIER UNIT (X08-2232-71)
SPEAKERS (A, B: 4~16Ω, A+B: 8~16Ω)
X08 B/5
K1
K2
K4
TONE UNIT (X11-2470-00)
SPEAKER A
SPEAKER B
CN 2
TONE CONT.
WINKING IND
POWER
DAT/TAPE-3
TAPE-2
TAPE-1
DAT/TAPE SELECTOR
BASS
VR3

T (X08-2232-71)

, A+B.8~16Ω)

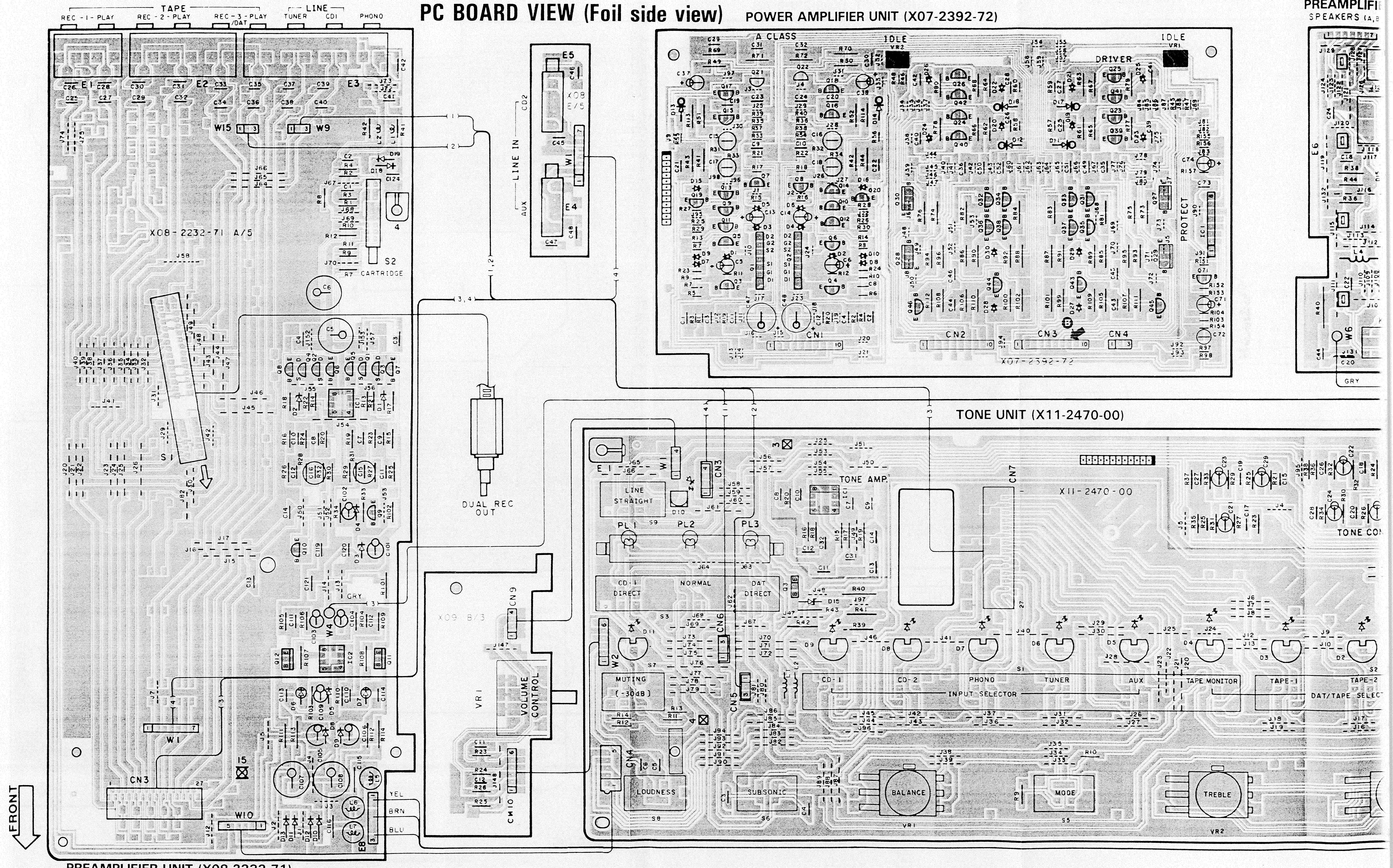
POWER AMPLIFIER UNIT (X07-2392-72)


IDLE
VR1
DRIVER
IDLE
VR2
A CLASS
PROTECT
CN4
CN3
CN2
CN1
X07-2392-72
E5
X08
E/5
W1
E4
C45
C46
C47
C48
CD2
LINE IN
AUX
PHONO
LINE
CD1
TUNER
TAPE
PLAY-3-REC
/DAT
PLAY-2-REC
PLAY-1-REC
E3
E2
E1
W9
W15
S2
CARTRIDGE
S1
X08-2232-71 A/5
GRY
W4
W1
CN3
15
W10
YEL
BRN
BLU
E8
FRONT
(1)
(2)
(1,2)
(3,4)
(3)
(4)
DUAL REC
OUT
CN9
X09 B/3
VOLUME
CONTROL
VR1
CN10
J25-5732-01
X11-2470-00
CN7
TONE AMP.
LINE
STRAIGHT
PL3
PL2
PL1
DAT
DIRECT
NORMAL
CD-
DIRECT
CN6
CN5
CN4
MUTING
(-30dB)
LOUDNESS
SUBSONIC
BALANCE
MODE
TREBLE
VR2
VR1
S5
S6
S8
TAPE-2
TAPE-1
TAPE MONITOR
AUX
TUNER
PHONO
CD-2
CD-1
INPUT SELECTOR
DAT/TAPE SELECTOR
TONE CONT.
K4
E6
GRY

PREAMPLIFIER UNIT (X08-2232-71)

Refer to the schematic diagram for the values of resistors and capacitors.

PC BOARD VIEW (Foil side view)

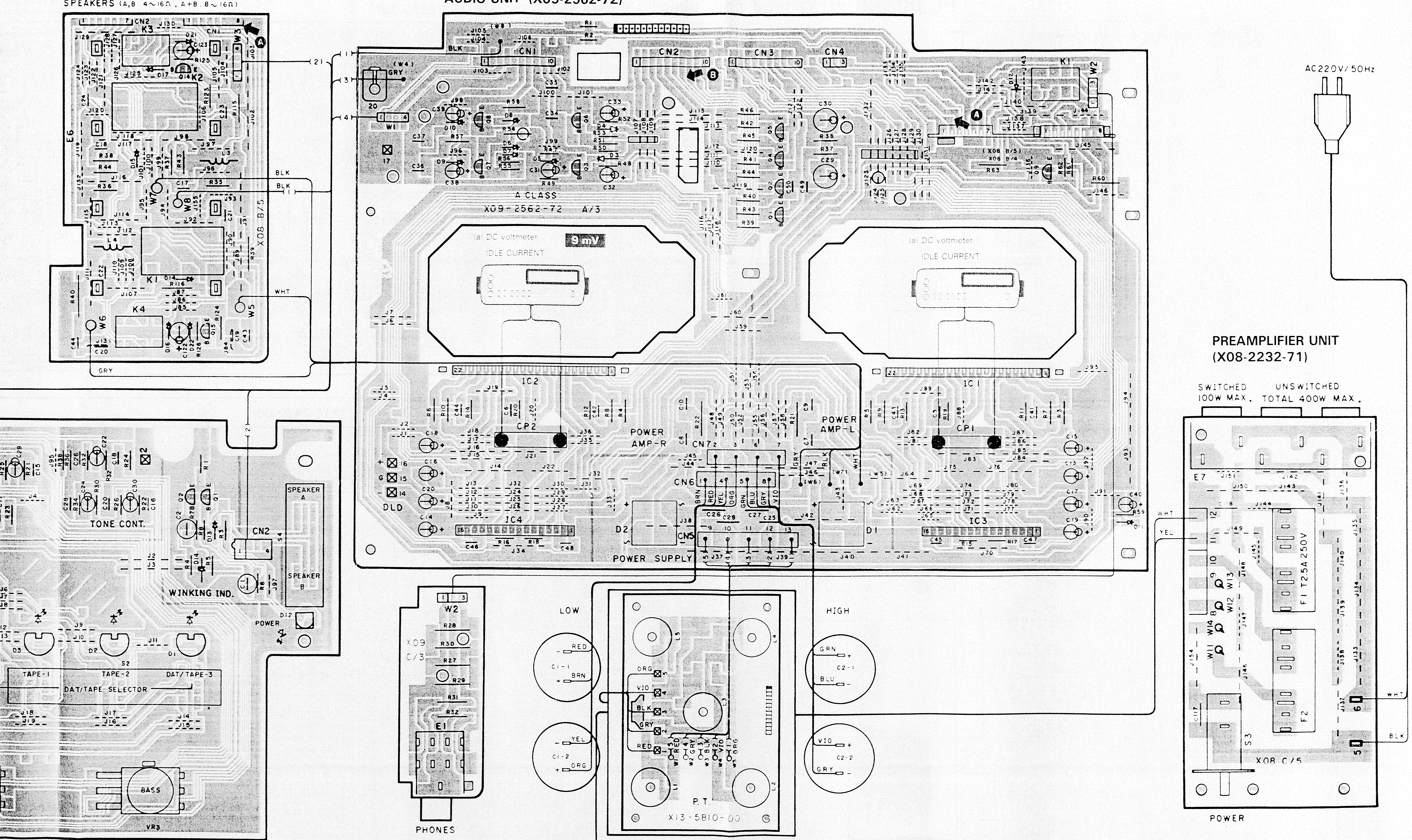

T
U
V
W
X
Y
Z
AA
AB
AC
1
2
3
4
5
6
7
TAPE
REC - 1 - PLAY
REC - 2 - PLAY
REC - 3 - PLAY /DAT
LINE
TUNER
CD1
PHONO
POWER AMPLIFIER UNIT (X07-2392-72)
PREAMPLIFI
SPEAKERS (A,B
A CLASS
IDLE
DRIVER
PROTECT
X07-2392-72
CN1
CN2
CN3
CN4
X08 E/5
LINE IN
CD2
AUX
E4
E5
X08-2232-71 A/5
CARTRIDGE
S2
S1
DUAL REC OUT
TONE UNIT (X11-2470-00)
X11-2470-00
LINE STRAIGHT
TONE AMP.
CD-1 DIRECT
NORMAL
DAT DIRECT
MUTING (-30dB)
CD-1
CD-2
PHONO
TUNER
AUX
TAPE MONITOR
TAPE-1
TAPE-2
INPUT SELECTOR
DAT/TAPE SELECT
TONE CON
X09 8/3
VR1
VOLUME CONTROL
LOUDNESS
SUBSONIC
BALANCE
MODE
TREBLE
CN3
W1
W10
E8
YEL
BRN
BLU
GRY
FRONT

PREAMPLIFIER UNIT (X08-2232-71)

PREAMPLIFIER UNIT (X08-2232-71)

SPEAKERS (A,B 4~16Ω, A+B 8~16Ω)

AUDIO UNIT (X09-2562-72)

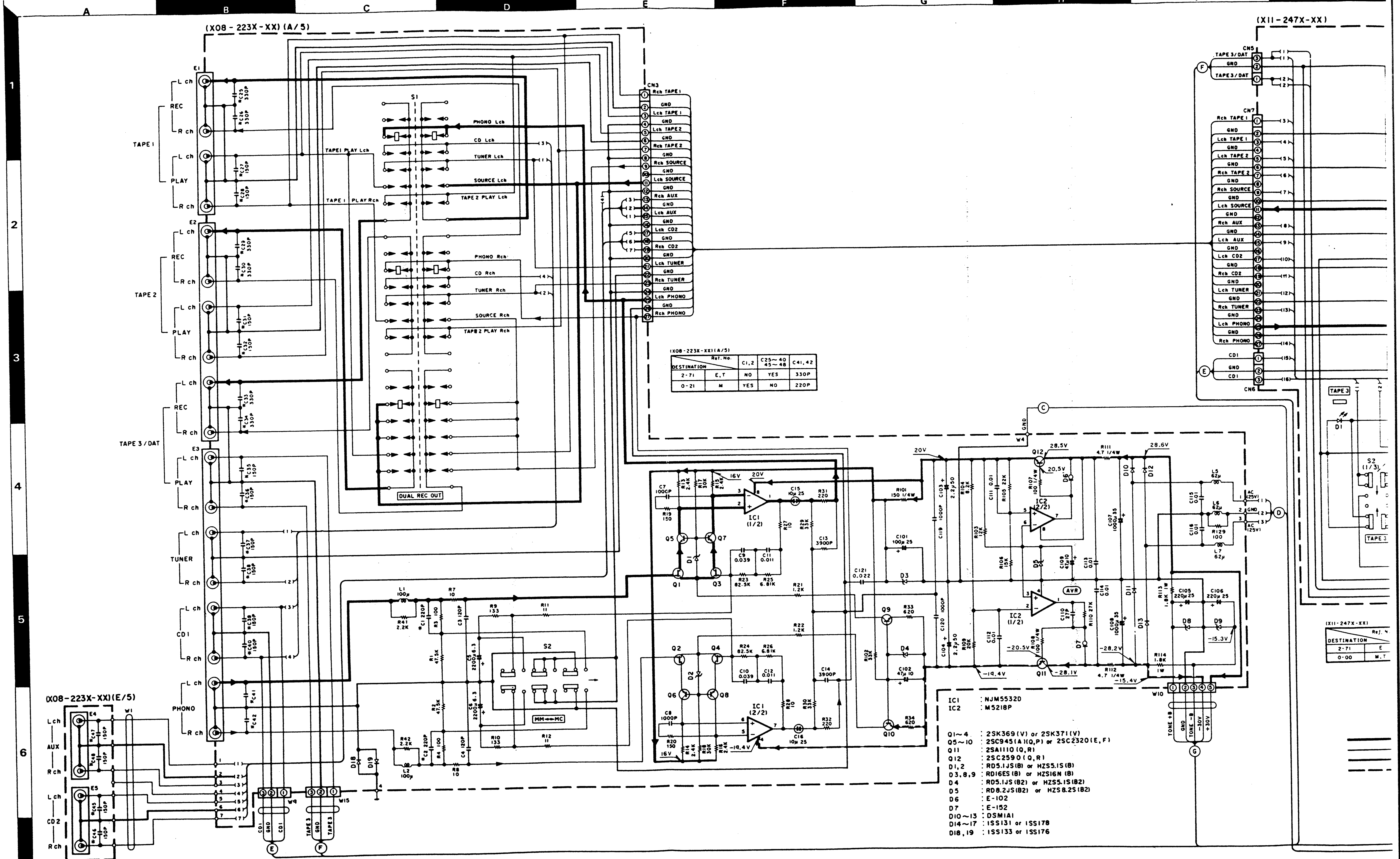


CN1
CN2
CN3
CN4
K1
K2
K3
K4
E6
W1
W2
W5
W6
W7
W8
BLK
WHT
GRY
X08 B/5
A CLASS
X09-2562-72 A/3
(a) DC voltmeter
IDLE CURRENT
9 mV
IC1
IC2
IC3
IC4
CP1
CP2
POWER AMP-R
POWER AMP-L
CN5
CN6
CN7
D1
D2
DLD
POWER SUPPLY
TONE CONT.
WINKING IND.
SPEAKER A
SPEAKER B
POWER
TAPE-1
TAPE-2
DAT/TAPE-3
DAT/TAPE SELECTOR
S2
BASS
VR3
X09 C/3
E1
PHONES
LOW
HIGH
C1-1
C1-2
C2-1
C2-2
RED
BRN
YEL
ORG
GRN
BLU
VIO
P.T.
X13-5810-00
AC220V/50Hz
SWITCHED 100W MAX.
UNSWITCHED TOTAL 400W MAX.
E7
F1 T2.5A 250V
F2
S3
X08 C/5

PREAMPLIFIER UNIT (X08-2232-71)

SUB-CIRCUIT UNIT (X13-5810-00)

Refer to the schematic diagram for the values of resistors and capacitors.


A
B
C
D
E
F
G
H
I
J
1
2
3
4
5
6
7
(X08-223X-XX) (A/5)
(X11-247X-XX)
(X08-223X-XX)(E/5)
TAPE 1
TAPE 2
TAPE 3 / DAT
TUNER
CD 1
PHONO
AUX
CD 2
REC
PLAY
L ch
R ch
E1
E2
E3
E4
E5
S1
S2
CN3
CN5
CN6
CN7
W1
W4
W9
W10
W15
PHONO Lch
CD Lch
TUNER Lch
SOURCE Lch
TAPE 2 PLAY Lch
TAPE1 PLAY Lch
TAPE 1 PLAY Rch
PHONO Rch
CD Rch
TUNER Rch
SOURCE Rch
TAPE 2 PLAY Rch
DUAL REC OUT
MM←→MC
Rch TAPE 1
Lch TAPE 1
Lch TAPE 2
Rch TAPE 2
Rch SOURCE
Lch SOURCE
Rch AUX
Lch AUX
Lch CD2
Rch CD2
Lch TUNER
Rch TUNER
Lch PHONO
Rch PHONO
GND
TAPE 3 / DAT
CD1
IC1 (1/2)
IC1 (2/2)
IC2 (1/2)
IC2 (2/2)
AVR
TONE +B
TONE -B
-30V
+30V
AC (25V)
20V
16V
28.5V
28.6V
20.5V
-20.5V
-19.4V
-28.1V
-28.2V
-15.4V
-15.3V
-19.4V

(X08-223X-XX) (A/5)

DESTINATION	Ref. No.	C1,2	C25～40 45～48	C41,42
2-71	E,T	NO	YES	330P
0-21	M	YES	NO	220P

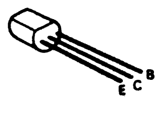
(X11-247X-XX)

DESTINATION	Ref. N
2-71	E
0-00	M,T

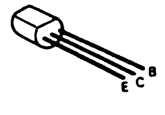
IC1 : NJM5532D
IC2 : M5218P

Q1～4 : 2SK369(V) or 2SK371(V)
Q5～10 : 2SC945(A)(Q,P) or 2SC2320(E,F)
Q11 : 2SA1110(Q,R)
Q12 : 2SC2590(Q,R)
D1,2 : RD5.1JS(B) or HZS5.1S(B)
D3,8,9 : RD16ES(B) or HZS16N (B)
D4 : RD5.1JS(B2) or HZS5.1S(B2)
D5 : RD8.2JS(B2) or HZS8.2S(B2)
D6 : E-102
D7 : E-152
D10～13 : DSM1A1
D14～17 : 1SS131 or 1SS178
D18,19 : 1SS133 or 1SS176

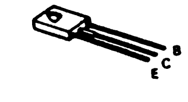
2SC2320



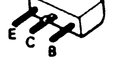
2SC945(A)



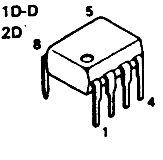
2SA1110
2SC2590



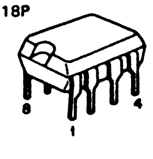
2SC2021F



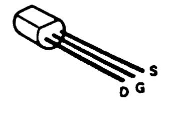
NJM2041D-D
NJM5532D



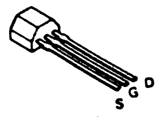
M5218P



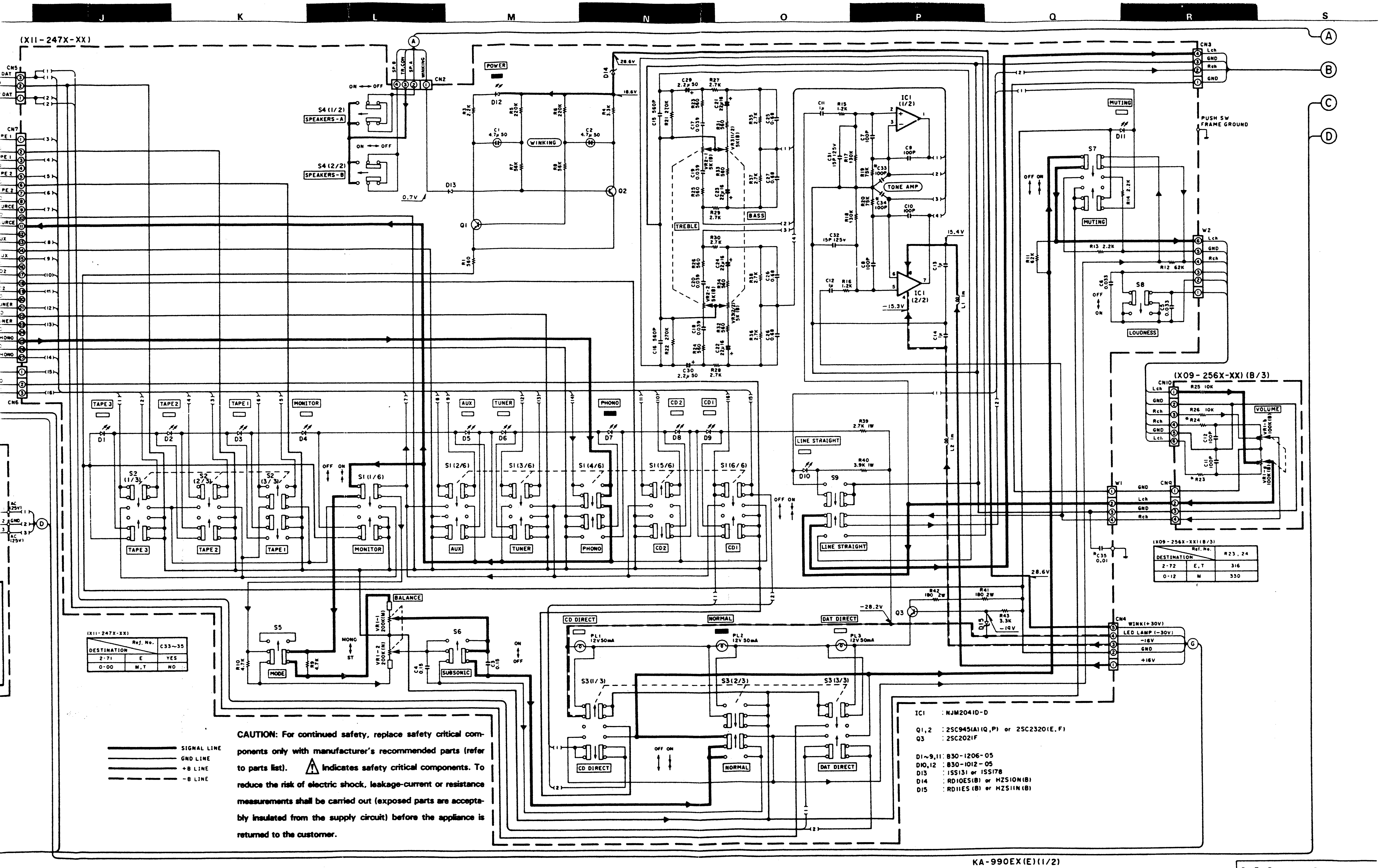
2SK369



2SK371



DC volt
voltmete
slightly
ments c


J
K
L
M
N
O
P
Q
R
S
(X11-247X-XX)
CN5
CN7
CN6
CN2
CN3
CN4
CN9
CN10
W1
W2
S4(1/2) SPEAKERS-A
S4(2/2) SPEAKERS-B
ON ←→ OFF
POWER
WINKING
D12
D13
D14
Q1
Q2
Q3
0.7V
28.6V
18.6V
TREBLE
BASS
IC1 (1/2)
IC1 (2/2)
TONE AMP
15.4V
-15.3V
MUTING
PUSH SW FRAME GROUND
S7
S8
LOUDNESS
(X09-256X-XX)(B/3)
VOLUME
TAPE 3
TAPE 2
TAPE 1
MONITOR
AUX
TUNER
PHONO
CD2
CD1
LINE STRAIGHT
S1(1/6)
S1(2/6)
S1(3/6)
S1(4/6)
S1(5/6)
S1(6/6)
S2(1/3)
S2(2/3)
S2(3/3)
S9
D1
D2
D3
D4
D5
D6
D7
D8
D9
D10
D11
D15
BALANCE
S5
MODE
MONO
ST
S6
SUBSONIC
CD DIRECT
NORMAL
DAT DIRECT
PL1 12V50mA
PL2 12V50mA
PL3 12V50mA
S3(1/3)
S3(2/3)
S3(3/3)
WINK(+30V)
LED LAMP (-30V)
-16V
GND
+16V
28.6V
-28.2V
-19V
SIGNAL LINE
GND LINE
+B LINE
-B LINE
KA-990EX(E)(1/2)

(X11-247X-XX)

DESTINATION \ Ref. No.		C33~35
2-71	E	YES
0-00	M,T	NO

(X09-256X-XX)(B/3)

DESTINATION \ Ref. No.		R23, 24
2-72	E,T	316
0-12	M	330

IC1 : NJM2041D-D

Q1,2 : 2SC945(A)(Q,P) or 2SC2320(E,F)
Q3 : 2SC2021F

D1~9,11 : B30-1206-05
D10,12 : B30-1012-05
D13 : 1SS131 or 1SS178
D14 : RD10ES(B) or HZS10N(B)
D15 : RD11ES(B) or HZS11N(B)

CAUTION: For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list). ⚠ Indicates safety critical components. To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.

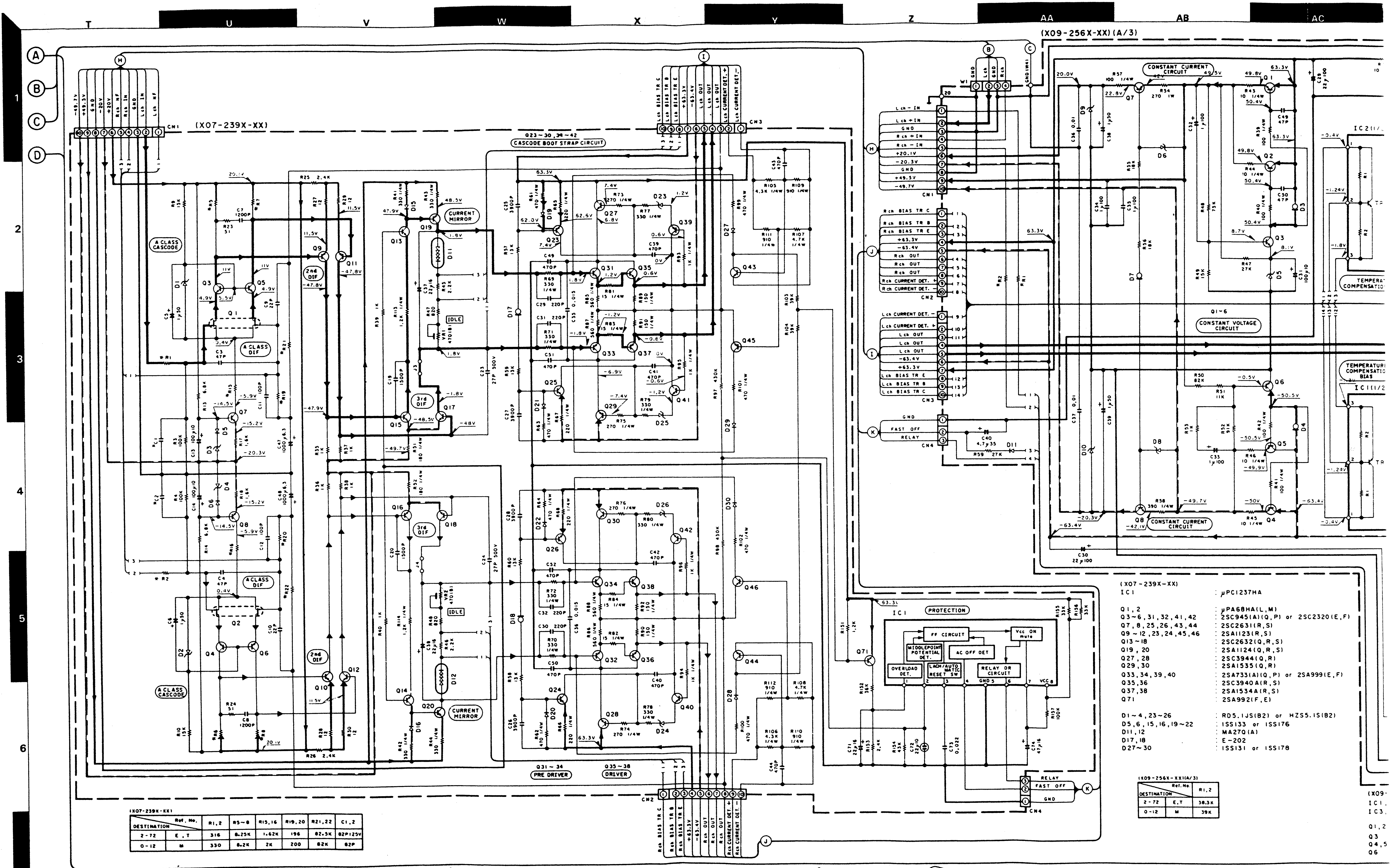
DC voltages are as measured with a high impedance voltmeter with no signal input. Values may vary slightly due to variations between individual instruments or/and units.

Les tensions c.c. doivent être mesurées avec un voltmètre à haute impédance sans signal d'entrée. Les valeurs peuvent différer légèrement du fait des variations inhérentes aux appareils et aux instruments de mesure individuels.

Die angegebenen Gleichspannungswerte wurden mit einem hochohmigen Spannungsmesser ohne Eingangssignal gemessen. Dabei schwanden die Meßwerte aufgrund von Unterschieden zwischen einzelnen Instrumenten oder Geräten u.U. geringfügig.

KA-990EX

KENWOOD


T
U
V
W
X
Y
Z
AA
AB
AC
1
2
3
4
5
6
7
(X09-256X-XX) (A/3)
(X07-239X-XX)
CN1
CN2
CN3
CN4
Q23~30, 39~42
CASCODE BOOT STRAP CIRCUIT
A CLASS CASCODE
A CLASS DIF
2nd DIF
3rd DIF
CURRENT MIRROR
IDLE
Q31~34
PRE DRIVER
Q35~38
DRIVER
PROTECTION
IC1
FF CIRCUIT
MIDDLEPOINT POTENTIAL DET.
AC OFF DET
Vcc ON mute
OVERLOAD DET.
LACH/AUTOMATIC RESET SW
RELAY OR CIRCUIT
CONSTANT CURRENT CIRCUIT
CONSTANT VOLTAGE CIRCUIT
Q1~6
TEMPERATURE COMPENSATION BIAS
FAST OFF
RELAY
GND
Lch IN
Rch IN
Lch NF
Rch NF
Lch OUT
Rch OUT
Lch BIAS TR C
Lch BIAS TR B
Lch BIAS TR E
Rch BIAS TR C
Rch BIAS TR B
Rch BIAS TR E
Lch CURRENT DET. +
Lch CURRENT DET. −
Rch CURRENT DET. +
Rch CURRENT DET. −
+63.3V
−63.4V
+49.5V
−49.7V
+20.1V
−20.3V

(X07-239X-XX)

DESTINATION		R1,2	R5~8	R15,16	R19,20	R21,22	C1,2
2-72	E , T	316	8.25K	1.62K	196	82.5K	82P125V
0-12	M	330	8.2K	2K	200	82K	82P

(X07-239X-XX)

IC1	: µPC1237HA
Q1,2	: µPA68HA(L,M)
Q3~6,31,32,41,42	: 2SC945(A)(Q,P) or 2SC2320(E,F)
Q7,8,25,26,43,44	: 2SC2631(R,S)
Q9~12,23,24,45,46	: 2SA1123(R,S)
Q13~18	: 2SC2632(Q,R,S)
Q19, 20	: 2SA1124(Q,R,S)
Q27, 28	: 2SC3944(Q,R)
Q29, 30	: 2SA1535(Q,R)
Q33,34,39,40	: 2SA733(A)(Q,P) or 2SA999(E,F)
Q35,36	: 2SC3940A(R,S)
Q37,38	: 2SA1534A(R,S)
Q71	: 2SA992(F,E)
D1~4,23~26	: RD5.1JS(B2) or HZS5.1S(B2)
D5,6,15,16,19~22	: 1SS133 or 1SS176
D11,12	: MA27Q(A)
D17,18	: E-202
D27~30	: 1SS131 or 1SS178

(X09-256X-XX)(A/3)

DESTINATION		R1,2
2-72	E,T	38.3K
0-12	M	39K

(X09-
IC1,
IC3,
Q1,2
Q3
Q4,5
Q6

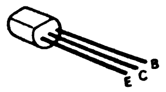
2SA1123
2SA1124
2SA1534A

2SA733(A)
2SA954
2SA992

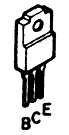
2SA999
2SC1845
2SC2003

2SC2320
2SC2631
2SC2632

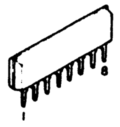
2SC3940A
2SC945(A)



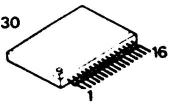
2SA1535
2SC3944



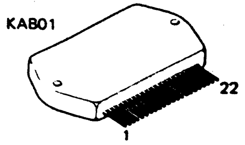
µPC1237HA



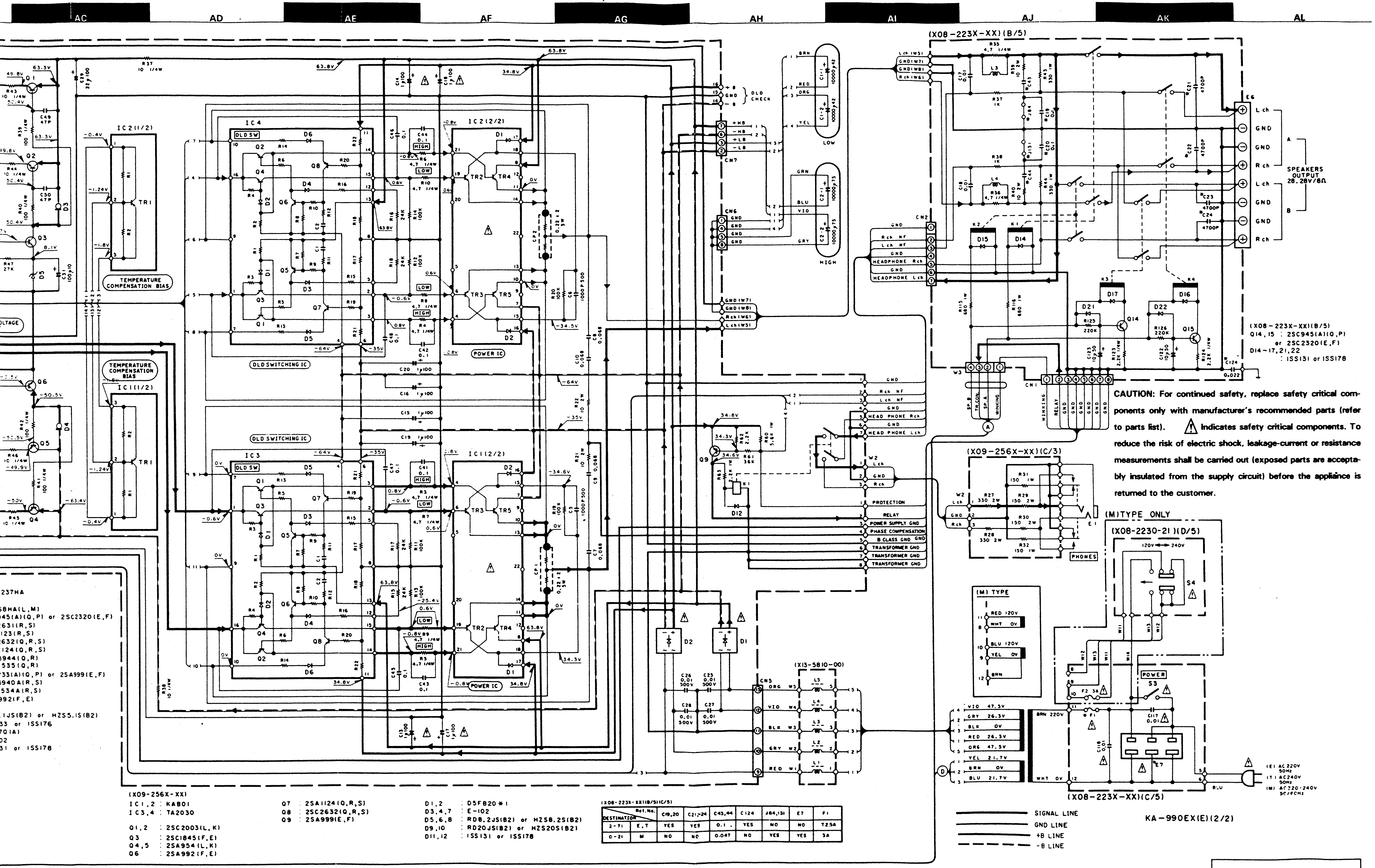
TA2030



KAB01



DC voltages are as measured with a high impedance voltmeter with no signal input. Values may vary slightly due to variations between individual instruments or/and units.


AC
AD
AE
AF
AG
AH
AI
AJ
AK
AL
(X08-223X-XX)(B/5)
IC4
IC2(2/2)
IC2(1/2)
IC3
IC1(2/2)
IC1(1/2)
DLD SW
DLD SWITCHING IC
POWER IC
TEMPERATURE COMPENSATION BIAS
TR1
DLD CHECK
CN7
CN6
CN5
CN2
CN1
W2
W3
E6
LOW
HIGH
SPEAKERS OUTPUT 28.28V/8Ω
L ch
GND
R ch
A
B
(X09-256X-XX)(C/3)
PHONES
(M)TYPE ONLY
(X08-2230-21)(D/5)
(M) TYPE
POWER
S3
S4
(X13-5810-00)
(X08-223X-XX)(C/5)
PROTECTION
RELAY
POWER SUPPLY GND
PHASE COMPENSATION
B CLASS GND
TRANSFORMER GND
HEAD PHONE R ch
HEAD PHONE L ch
(E) AC220V 50Hz
(T) AC240V 50Hz
(M) AC220-240V 50/60Hz
(X08-223X-XX)(B/5)
Q14, 15 : 2SC945(A)(Q,P) or 2SC2320(E,F)
D14~17,21,22 : 1SS131 or 1SS178
237HA
58HA(L,M)
45(A)(Q,P) or 2SC2320(E,F)
631(R,S)
123(R,S)
632(Q,R,S)
124(Q,R,S)
944(Q,R)
535(Q,R)
33(A)(Q,P) or 2SA999(E,F)
940A(R,S)
534A(R,S)
992(F,E)
1JS(B2) or HZS5.1S(B2)
33 or 1SS176
70(A)
02
31 or 1SS178
SIGNAL LINE
GND LINE
+B LINE
-B LINE
KA-990EX(E)(2/2)

CAUTION: For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list). ⚠ Indicates safety critical components. To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.

(X09-256X-XX)
IC1,2 : KA801
IC3,4 : TA2030

Q1,2 : 2SC2003(L,K)
Q3 : 2SC1845(F,E)
Q4,5 : 2SA954(L,K)
Q6 : 2SA992(F,E)

Q7 : 2SA1124(Q,R,S)
Q8 : 2SC2632(Q,R,S)
Q9 : 2SA999(E,F)

D1,2 : D5FB20✱1
D3,4,7 : E-102
D5,6,8 : RD8.2JS(B2) or HZS8.2S(B2)
D9,10 : RD20JS(B2) or HZS20S(B2)
D11,12 : 1SS131 or 1SS178

(X08-223X-XX)(B/5)(C/5)

DESTINATION \ Ref.No.		C19,20	C21~24	C43,44	C124	J84,131	E7	F1
2-71	E,T	YES	YES	0.1	YES	NO	NO	T2.5A
0-21	M	NO	NO	0.047	NO	YES	YES	3A

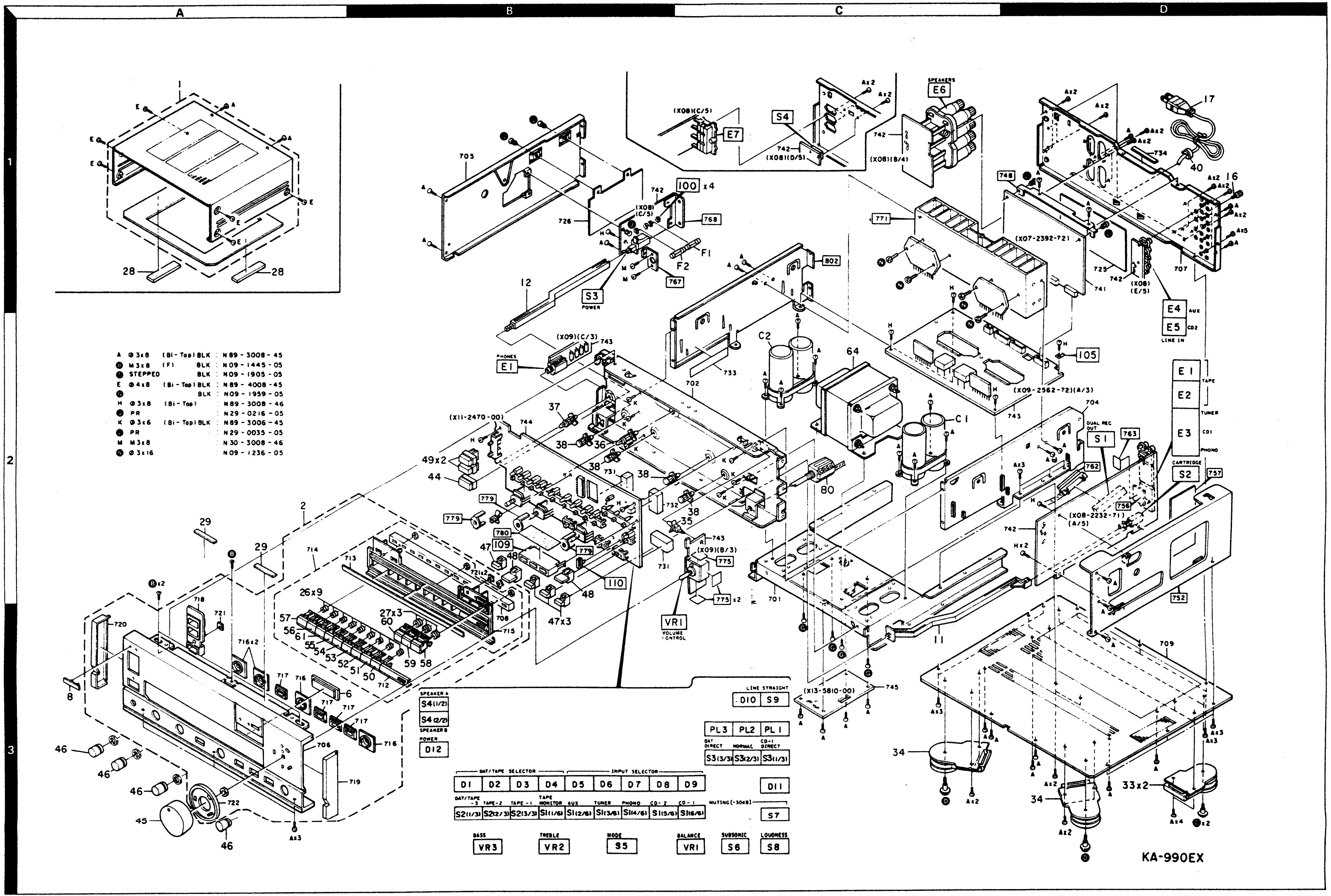
Les tensions c.c. doivent être mesurées avec un voltmètre à haute impédance sans signal d'entrée. Les valeurs peuvent différer légèrement du fait des variations inhérentes aux appareils et aux instruments de mesure individuels.

Die angegebenen Gleichspannungswerte wurden mit einem hochohmigen Spannungsmesser ohne Eingangssignal gemessen. Dabei schwanden die Meßwerte aufgrund von Unterschieden zwischen einzelnen Instrumenten oder Geräten u.U. geringfügig.

KA-990EX
KENWOOD

KA-990EX KA-990EX

EXPLODED VIEW


A
B
C
D
1
2
3
1
E
28
28
705
726
742
(X08)(C/5)
100 x4
768
F1
F2
767
S3
POWER
12
(X08)(C/5)
E7
S4
742
(X08)(D/5)
742
(X08)(B/4)
SPEAKERS
E6
17
734
40
16
748
771
(X07-2392-72)
725
741
742
(X08)(E/5)
707
E4 AUX
E5 CD2
LINE IN
802
C2
64
733
702
105
(X09-2562-72)(A/3)
743
704
C1
E1 TAPE
E2 TUNER
E3 CD1 PHONO
DUAL REC OUT
S1
763
CARTRIDGE
S2
757
762
756
(X08-2232-71)(A/5)
742
752
PHONES
E1
(X09)(C/3)
743
(X11-2470-00)
744
37
38
36
38
731
38
49x2
44
779
779
780
109
47
779
732
35
38
743
(X09)(B/3)
775
775 x2
731
110
48
47x3
80
VR1
VOLUME CONTROL
701
11
709
29
29
2
714
713
721x2
26x9
27x3
60
57
56
61
55
54
53
52
51
50
59
58
708
715
712
718
721
716x2
720
8
717
716
6
717
717
716
706
719
722
46
46
46
45
46
Ax3
(X13-5810-00)
745
34
34
33x2
Ax2
Ax3
Ax4
SPEAKER A
S4(1/2)
S4(2/2)
SPEAKER B
POWER
D12
LINE STRAIGHT
D10
S9
PL3
PL2
PL1
DAT DIRECT
NORMAL
CD-1 DIRECT
S3(3/3)
S3(2/3)
S3(1/3)
DAT/TAPE SELECTOR
INPUT SELECTOR
D1
D2
D3
D4
D5
D6
D7
D8
D9
D11
DAT/TAPE-3
TAPE-2
TAPE-1
TAPE MONITOR
AUX
TUNER
PHONO
CD-2
CD-1
MUTING(-304B)
S2(1/3)
S2(2/3)
S2(3/3)
S1(1/6)
S1(2/6)
S1(3/6)
S1(4/6)
S1(5/6)
S1(6/6)
S7
BASS
VR3
TREBLE
VR2
MODE
S5
BALANCE
VR1
SUBSONIC
S6
LOUDNESS
S8
KA-990EX

A	Ø3x8	(Bi-Top)	BLK	N89-3008-45
Ⓑ	M3x8	(F)	BLK	N09-1445-05
Ⓕ	STEPPED		BLK	N09-1905-05
E	Ø4x8	(Bi-Top)	BLK	N89-4008-45
Ⓖ			BLK	N09-1959-05
H	Ø3x8	(Bi-Top)		N89-3008-46
Ⓙ	PR			N29-0216-05
K	Ø3x6	(Bi-Top)	BLK	N89-3006-45
Ⓛ	PR			N29-0035-05
M	M3x8			N30-3008-46
Ⓝ	Ø3x16			N09-1236-05

Parts with the exploded numbers larger than 700 are not supplied.

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				KA-990EX		
1	1A	*	A01-1605-01	METALLIC CABINET		
2	2A	*	A20-5393-02	PANEL ASSY		
6	3B		B10-0909-04	FRONT GLASS		
8	3A		B43-0278-04	KENWOOD BADGE		
-			B46-0122-13	WARRANTY CARD	E	
-			B46-0143-03	WARRANTY CARD	T	
-		*	B50-8659-00	INSTRUCTION MANUAL(ENGLISH)		
-		*	B50-8660-00	INSTRUCTION MANUAL(FRENCH)		
-		*	B50-8661-00	INSTRUCTION MANUAL(SPANISH)	M	
-		*	B50-8663-00	INSTRUCTION MANUAL(G,D,I)	E	
-			B58-0803-13	CAUTION CARD	E	
C1	2D	*	C90-1599-05	ELECTRO 10000UF 56WV		
C2	1C	*	C90-1600-05	ELECTRO 10000UF 75WV		
11	3C		D21-1415-03	EXTENSION SHAFT(CARTRIDGE)		
12	1B		D21-1416-03	EXTENSION SHAFT(POWER SW)		
16	1D		E21-0006-25	BINDING POST		
⚠ 17	1D		E30-0459-05	AC POWER CORD	E	
⚠ 17	1D		E30-0812-05	AC POWER CORD	M	
⚠ 17	1D		E30-1416-05	AC POWER CORD	T	
⚠ F1	1C		F05-2525-05	FUSE (SEMKO) (250V T2.5A)	ET	
⚠ F1 ,2	1C		F05-3022-05	FUSE (250V 3A)	M	
26	2A		G01-2138-04	COMPRESSION SPRING (DAT)		
27	3B		G01-2139-04	COMPRESSION SPRING (DIGITAL)		
28	1A	*	G11-0153-04	SOFT TAPE (80X12X3) CASE		
29	2A	*	G11-0155-14	SOFT TAPE (40X9X2) PANEL		
-		*	H01-7724-04	ITEM CARTON CASE		
-			H10-3519-02	POLYSTYRENE FOAMED FIXTURE		
-			H10-3520-02	POLYSTYRENE FOAMED FIXTURE		
-			H25-0232-04	PROTECTION BAG (235X350X0.03)		
-			H25-0274-04	PROTECTION BAG (900X500X0.05)		
33	3D		J02-0357-05	INSULATOR ASSY (4KG)		
34	3C,3D	*	J02-0359-05	INSULATOR ASSY (5KG)		
35	1C,2C		J19-0506-05	UNIT HOLDER (H=8.3)		
36	2B		J19-0514-05	UNIT HOLDER (H=11.3)		
37	2B		J19-0515-05	UNIT HOLDER (H=14.6)		
38	2B,2C		J19-2536-05	UNIT HOLDER		
⚠ 40	1D		J42-0083-05	POWER CORD BUSHING		
-			J61-0307-05	WIRE BAND		
44	2B		K29-2432-03	KNOB ASSY(BUTTON)POWER		
45	3A		K29-2837-04	KNOB (VOLUME CONTROL)		
46	3A		K29-2838-04	KNOB (BASS,TREB,BAL,REC OUT)		
47	2B,3B		K29-2843-04	KNOB ASSY(BUTTON)TURNOVER,MO		
48	2B		K29-2845-04	KNOB ASSY(BUTTON)DAT,CD,MUTE		
49	2B		K29-2847-04	KNOB ASSY(BUTTON)SPEAKER		
50	3B	*	K29-2857-04	KNOB ASSY(BUTTON)CD1		
51	3B	*	K29-2858-04	KNOB ASSY(BUTTON)CD2		
52	3B		K29-2850-04	KNOB ASSY(BUTTON)PHONO		
53	3A		K29-2851-04	KNOB ASSY(BUTTON)TUNER		
54	3A		K29-2852-04	KNOB ASSY(BUTTON)AUX		
55	3A		K29-2853-04	KNOB ASSY(BUTTON)TAPE MONI		

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56	3A	*	K29-2860-04	KNOB ASSY(BUTTON)TAPE2		
57	3A	*	K29-2861-04	KNOB ASSY(BUTTON)DAT/TAPE2		
58	3B		K29-2862-04	KNOB ASSY(BUTTON)CD DIRECT		
59	3B	*	K29-2865-04	KNOB ASSY(BUTTON)NORMAL		
60	3B	*	K29-2866-04	KNOB ASSY(BUTTON)DAT DIRECT		
61	3A	*	K29-2859-04	KNOB ASSY(BUTTON)TAPE1		
⚠ 64	2C	*	L01-4882-05	POWER TRANSFORMER	E	
⚠ 64	2C	*	L01-4885-05	POWER TRANSFORMER	M	
⚠ 64	2C	*	L01-4887-05	POWER TRANSFORMER	T	
B	2A		N09-1445-05	SET SCREW(M3X8FLAT HEAD) PANEL		
D	3C,3D		N09-1905-05	STEPPED SCREW (FOOT)		
G	3C	*	N09-1959-05	TAPTITE SCREW		
J	1B		N29-0216-05	RIVET		
80	2C		S90-0106-05	REMOTE SWITCH SHAFT		
				POWER AMPLIFIER UNIT (X07-2392-72)		
C1 ,2			CC45FSL1H820J	CERAMIC 82PF J	M	
C1 ,2			C91-0177-05	POLYSTY 82PF K	ET	
C3 ,4			CC45FSL1H470J	CERAMIC 47PF J	M	
C3 ,4		*	C91-0979-05	CERAMIC 47PF G	ET	
C5 ,6			CE04KW1H010MEL	ELECTRO 1.0UF 50WV		
C7 ,8			CF92FV1H122J	MF 1200PF J		
C9 ,10			CC45FSL1H220J	CERAMIC 22PF J	M	
C9 ,10		*	C91-0978-05	CERAMIC 22PF G	ET	
C11 ,12			CC45FSL1H101J	CERAMIC 100PF J	M	
C11 ,12			CQ09FS1H101JZS	POLYSTY 100PF J	ET	
C13 ,14			CE04KW1A101MEL	ELECTRO 100UF 10WV		
C19 ,20			CK45FB1H152K	CERAMIC 1500PF K		
C23 ,24			CC45FSL2H270J	CERAMIC 27PF J		
C25 -28			CF92FV1H392J	MF 3900PF J		
C29			CC45FSL1H221J	CERAMIC 220PF J		
C30			CC45FSL1H221J	CERAMIC 220PF J		
C31 ,32			CC45FSL1H221J	CERAMIC 220PF J		
C35 ,36			CF92FV1H153J	MF 0.015UF J		
C37 ,38			CE04KW1C220MEL	ELECTRO 22UF 16WV		
C39 -44			CK45FB1H471K	CERAMIC 470PF K		
C47 ,48			CE04KW0J102MEL	ELECTRO 1000UF 6.3WV		
C49 -52			CK45FB1H471K	CERAMIC 470PF K		
C71			CE04KW1C220MEL	ELECTRO 22UF 16WV		
C72			C90-1333-05	NP-ELEC 22UF 10WV		
C73			CF92FV1H223J	MF 0.022UF J		
C74			CE04KW1C470MEL	ELECTRO 47UF 16WV		
L	1D		N29-0035-05	PUSH RIVET (3.5X5.5)		
R1 ,2			RN14BK2C3160FTS	RN 316.0 F 1/6W	ET	
R3 ,4			RN14BK2C1003FTS	RN 100K F 1/6W	ET	
R5 -8			RN14BK2C8251FTS	RN 8.25K F 1/6W	ET	
R15 ,16			RN14BK2C1621FTS	RN 1.62K F 1/6W	ET	
R19 ,20			RN14BK2C1960FTS	RN 196.0 F 1/6W	ET	
R21 ,22			RN14BK2C8252FTS	RN 82.5K F 1/6W	ET	
R41 -44			RD14AB2E331JTS	FL-PROOF RD 330 J 1/4W		
R51 ,52			RD14AB2E181JTS	FL-PROOF RD 180 J 1/4W		
R61 -64			RD14AB2E471JTS	FL-PROOF RD 470 J 1/4W		
R65 -68			RD14AB2E221JTS	FL-PROOF RD 220 J 1/4W		

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R69 -72			RD14AB2E331JTS	FL-PROOF RD 330 J 1/4W		
R73 -76			RD14AB2E271JTS	FL-PROOF RD 270 J 1/4W		
R77 -80			RD14AB2E331JTS	FL-PROOF RD 330 J 1/4W		
R81 -84			RD14AB2E150JTS	FL-PROOF RD 15 J 1/4W		
R85 -88			RD14AB2E561JTS	FL-PROOF RD 560 J 1/4W		
R89 -92			RD14AB2E151JTS	FL-PROOF RD 150 J 1/4W		
R93 -96			RD14AB2E102JTS	FL-PROOF RD 1.0K J 1/4W		
R99 -102			RD14AB2E471JTS	FL-PROOF RD 470 J 1/4W		
R105,106		*	RD14AB2E432JTS	FL-PROOF RD 4.3K J 1/4W		
R107,108		*	RD14AB2E472JTS	FL-PROOF RD 4.7K J 1/4W		
R109-112			RD14AB2E911JTS	FL-PROOF RD 910 J 1/4W		
R113,114			RD14AB2E122JTS	FL-PROOF RD 1.2K J 1/4W		
VR1 ,2		*	R12-0109-05	TRIMMING POT.(470B)IDLE		
D1 -4			HZS5.1S(B2)	ZENER DIODE		
D1 -4			RD5.1JS(B2)	ZENER DIODE		
D5 ,6			1SS133	DIODE		
D5 ,6			1SS176	DIODE		
D11 ,12			MA27Q(A)	VARISTOR		
D15 ,16			1SS133	DIODE		
D15 ,16			1SS176	DIODE		
D17 ,18			E-202	CONSTANT CURRENT DIODE		
D19 -22			1SS133	DIODE		
D19 -22			1SS176	DIODE		
D23 -26			HZS5.1S(B2)	ZENER DIODE		
D23 -26			RD5.1JS(B2)	ZENER DIODE		
D27 -30			1SS131	DIODE		
D27 -30			1SS178	DIODE		
IC1			UPC1237HA	IC(POWER AMP)		
Q1 ,2		*	UPA68HA(L,M)	DUAL FET		
Q3 -6			2SC2320(E,F)	TRANSISTOR		
Q3 -6			2SC945(A)(Q,P)	TRANSISTOR		
Q7 ,8			2SC2631(R,S)	TRANSISTOR		
Q9 -12			2SA1123(R,S)	TRANSISTOR		
Q13 -18			2SC2632(Q,R,S)	TRANSISTOR		
Q19 ,20			2SA1124(Q,R,S)	TRANSISTOR		
Q23 ,24			2SA1123(R,S)	TRANSISTOR		
Q25 ,26			2SC2631(R,S)	TRANSISTOR		
Q27 ,28			2SC3944(Q,R)	TRANSISTOR		
Q29 ,30			2SA1535(Q,R)	TRANSISTOR		
Q31 ,32			2SC2320(E,F)	TRANSISTOR		
Q31 ,32			2SC945(A)(Q,P)	TRANSISTOR		
Q33 ,34			2SA733(A)(Q,P)	TRANSISTOR		
Q33 ,34			2SA999(E,F)	TRANSISTOR		
Q35 ,36			2SC3940A(R,S)	TRANSISTOR		
Q37 ,38			2SA1534A(R,S)	TRANSISTOR		
Q39 ,40			2SA733(A)(Q,P)	TRANSISTOR		
Q39 ,40			2SA999(E,F)	TRANSISTOR		
Q41 ,42			2SC2320(E,F)	TRANSISTOR		
Q41 ,42			2SC945(A)(Q,P)	TRANSISTOR		
Q43 ,44			2SC2631(R,S)	TRANSISTOR		
Q45 ,46			2SA1123(R,S)	TRANSISTOR		
Q71			2SA992(F,E)	TRANSISTOR		
PREAMPLIFIER UNIT (X08-2232-71)						
C1 ,2		*	CF92FV1H221K	MF 220PF K		

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C3 ,4			CF92FV1H121K	MF 120PF K		
C5 ,6			CE04KW0J222M	ELECTRO 2200UF 6.3WV		
C7 ,8			CK45FB1H102K	CERAMIC 1000PF K		
C9 ,10			C91-0790-05	FILM 0.039UF J		
C11 ,12			CQ93HP2A113G	MYLAR 0.011UF G		
C13 ,14			CQ93HP2A392J	MYLAR 3900PF J		
C15 ,16			C90-1332-05	NP-ELEC 10UF 25WV		
C17 ,18			CF92FV1H103J	MF 0.010UF J		
C19 ,20			CF92FV1H104J	MF 0.10UF J	ET	
C21 -24			CF92FV1H472J	MF 4700PF J	ET	
C25 ,26		*	CF92FV1H331K	MF 330PF K	ET	
C27 ,28		*	CF92FV1H151K	MF 150PF K	ET	
C29 ,30		*	CF92FV1H331K	MF 330PF K	ET	
C31 ,32		*	CF92FV1H151K	MF 150PF K	ET	
C33 ,34		*	CF92FV1H331K	MF 330PF K	ET	
C35 -40		*	CF92FV1H151K	MF 150PF K	ET	
C41 ,42		*	CF92FV1H221K	MF 220PF K	M	
C41 ,42		*	CF92FV1H331K	MF 330PF K	ET	
C43 ,44			CF92FV1H104J	MF 0.10UF J	ET	
C43 ,44			CF92FV1H473J	MF 0.047UF J	M	
C45 -48		*	CF92FV1H151K	MF 150PF K	ET	
C101			CE04KW1E101M	ELECTRO 100UF 25WV		
C102			CE04KW1A470M	ELECTRO 47UF 10WV		
C103,104			CE04KW1H2R2M	ELECTRO 2.2UF 50WV		
C105,106			CE04KW1E221M	ELECTRO 220UF 25WV		
C107,108			CE04KW1V102M	ELECTRO 1000UF 35WV		
C109			CE04KW1A470M	ELECTRO 47UF 10WV		
C110			CC45FSL1H270J	CERAMIC 27PF J		
C111-114			CF92FV1H103J	MF 0.010UF J		
C115,116			CK45FE2H103P	CERAMIC 0.010UF P		
⚠ C117,118			C91-0023-05	CERAMIC 0.01UF AC250V	M	
⚠ C117,118			C91-0647-05	CERAMIC 0.01UF P	ET	
C119,120			CF92FV1H102J	MF 1000PF J		
C121			CF92FV1H223J	MF 0.022UF J		
C122,123			CE04KW1H100M	ELECTRO 10UF 50WV		
C124			CF92V1H223J	MF 0.022UF J	ET	
E1	2D		E13-0497-05	PHONO JACK(4P) TAPE1		
E2	2D		E13-0621-05	PHONO JACK(6P) TAPE2		
E3	2D	*	E13-0821-05	PHONO JACK (TUNER,PHONO)		
E4 ,5	1D		E13-0223-05	PHONO JACK(2P) AUX,CD2		
E6	1C		E20-0830-05	SCREW TERMINAL BOARD	M	
E6	1C	*	E20-0831-05	SCREW TERMINAL BOARD	ET	
⚠ E7	1B		E03-0093-05	AC OUTLET	M	
100	1B		J13-0041-05	FUSE CLIP (Ø6)	M	
100	1B		J13-0054-05	FUSE CLIP (Ø5)	ET	
-			J61-0033-05	WIRE BAND		
-			J61-0307-05	WIRE BAND		
L1 ,2			L40-1011-47	SMALL FIXED INDUCTOR(100UH,K)		
L3 ,4			L39-0080-15	PHASE-COMPENSATION COIL		
L5 -7			L33-0328-05	CHOKE COIL		
R1 ,2			RN14BK2C4752FTS	RN 47.5K F 1/6W		
R3 ,4			RN14BK2C1000FTS	RN 100.0 F 1/6W		
R7 ,8			RN14BK2C10R0FTS	RN 10.0 F 1/6W		

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R9 ,10			RN14BK2C1330FTS	RN 133.0 F 1/6W		
R11 ,12			RN14BK2C11R0FTS	RN 11.0 F 1/6W		
R23 ,24			RN14BK2C8252FTS	RN 82.5K F 1/6W		
R25 ,26			RN14BK2C6811FTS	RN 6.81K F 1/6W		
R27 ,28			RN14BK2C10R0FTS	RN 10.0 F 1/6W		
R35 ,36			RD14AB2E4R7JTS	FL-PROOF RD 4.7 J 1/4W		
R37 ,38			RN14BK2C1001FTS	RN 1.00K F 1/6W		
R39 ,40			RS14DB3D100JTE	FL-PROOF RS 10 J 2W		
R43		*	RS14KB3A331JTE	FL-PROOF RS 330 J 1W		
R44		*	RS14DB3A331JTE	FL-PROOF RS 330 J 1W		
R101			RD14AB2E151JTS	FL-PROOF RD 150 J 1/4W		
R107,108			RD14AB2E101JTS	FL-PROOF RD 100 J 1/4W		
R111			RD14AB2E4R7JTS	FL-PROOF RD 4.7 J 1/4W		
R112			RD14GB2E4R7JTS	FL-PROOF RD 4.7 J 1/4W		
R113,114			RS14DB3A182JTE	FL-PROOF RS 1.8K J 1W		
R115,116			RS14DB3A681JTE	FL-PROOF RS 680 J 1W		
R123,124		*	RD14AB2E222JTS	FL-PROOF RD 2.2K J 1/4W		
K1 ,2			S51-2045-05	MAGNETIC RELAY		
K3 ,4		*	S51-2075-05	MAGNETIC RELAY		
S1	2D		S90-0078-05	SLIDE SWITCH (DUAL REC OUT)		
S2	2D		S40-6027-05	PUSH SWITCH (CARTRIDGE)		
⚠ S3	1B		S40-1073-05	PUSH SWITCH (POWER)		
⚠ S4	1C		S31-2115-05	SLIDE SWITCH (240V-120V)	M	
D1 ,2			HZS5.1S(B)	ZENER DIODE		
D1 ,2			RD5.1JS(B)	ZENER DIODE		
D3			HZS16N(B)	ZENER DIODE		
D3			RD16ES(B)	ZENER DIODE		
D4			HZS5.1S(B2)	ZENER DIODE		
D4			RD5.1JS(B2)	ZENER DIODE		
D5			HZS8.2S(B2)	ZENER DIODE		
D5			RD8.2JS(B2)	ZENER DIODE		
D6			E-102	CONSTANT CURRENT DIODE		
D7			E-152	CONSTANT CURRENT DIODE		
D8 ,9			HZS16N(B)	ZENER DIODE		
D8 ,9			RD16ES(B)	ZENER DIODE		
D10 -13			DSM1A1	DIODE		
D14 -17			1SS131	DIODE		
D14 -17			1SS178	DIODE		
D18 ,19			1SS133	DIODE		
D18 ,19			1SS176	DIODE		
D21 ,22			1SS131	DIODE		
D21 ,22			1SS178	DIODE		
IC1			NJM5532D	IC(OP AMP X2)		
IC2			M5218P	IC(OP AMP X2)		
Q1 -4			2SK369(V)	FET		
Q1 -4			2SK371(V)	FET		
Q5 -10			2SC2320(E,F)	TRANSISTOR		
Q5 -10			2SC945(A)(Q,P)	TRANSISTOR		
Q11			2SA1110(Q,R)	TRANSISTOR		
Q12			2SC2590(Q,R)	TRANSISTOR		
Q14 ,15			2SC2320(E,F)	TRANSISTOR		
Q14 ,15			2SC945(A)(Q,P)	TRANSISTOR		

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⚠ indicates safety critical components.

PARTS LIST

* New Parts
Parts without Parts No. are not supplied.
Les articles non mentionnes dans le Parts No. ne sont pas fournis.
Teile ohne Parts No. werden nicht geliefert.

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
AUDIO UNIT (X09-2562-72)						
C5 ,6			CK45FB2H102K	CERAMIC 1000PF K		
C7 -10			CF92FV1H683J	MF 0.068UF J		
C11 ,12			CC45FSL1H101J	CERAMIC 100PF J	M	
C11 ,12			CQ09FS1H101JZS	POLYSTY 100PF J	ET	
C13 -20			CE04KW2A010M	ELECTRO 1.0UF . 100WV		
C25 -28			CK45FE2H103P	CERAMIC 0.010UF P		
C29 ,30			CE04KW2A220M	ELECTRO 22UF 100WV		
C31			CE04KW1A101M	ELECTRO 100UF 10WV		
C32 ,33			CE04KW2A010M	ELECTRO 1.0UF 100WV		
C34 ,35			C91-0033-05	MF 1UF 100V		
C36 ,37			CF92FV1H103J	MF 0.010UF J		
C38 ,39			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C40			CE04KW1V4R7M	ELECTRO 4.7UF 35WV		
C41 -48			CF92FV1H104J	MF 0.10UF J		
C49 ,50			CC45FSL1H470J	CERAMIC 47PF J		
E1	2B		E11-0174-05	PHONE JACK (PHONES)		
N	1C,1D		N09-1236-05	TAPPING SCREW (Ø3X16)		
CP1 ,2			R90-0187-05	MULTI-COMP 0.22X2 K 5W		
R1 ,2			RN14BK2C3832F	RN 38.3K F 1/6W	ET	
R3 -10			RD14AB2E4R7JTS	FL-PROOF RD 4.7 J 1/4W		
R21 ,22			RS14DB3D100JTE	FL-PROOF RS 10 J 2W		
R23 ,24			RN14BK2C3160F	RN 316.0 F 1/6W	ET	
R27 ,28			RS14DB3D331JTE	FL-PROOF RS 330 J 2W		
R29 ,30			RS14DB3D151JTE	FL-PROOF RS 150 J 2W		
R31 ,32			RS14DB3A151JTE	FL-PROOF RS 150 J 1W		
R37 ,38			RD14AB2E100JTS	FL-PROOF RD 10 J 1/4W		
R39 -42			RD14AB2E101JTS	FL-PROOF RD 100 J 1/4W		
R43 -46			RD14AB2E100JTS	FL-PROOF RD 10 J 1/4W		
R54		*	RS14DB3A271JTE	FL-PROOF RS 270 J 1W		
R57			RD14AB2E101JTS	FL-PROOF RD 100 J 1/4W		
R58			RD14AB2E391JTS	FL-PROOF RD 390 J 1/4W		
R60		*	RS14DB3A562JTE	FL-PROOF RS 5.6K J 1W		
R63			RS14DB3A222JTE	FL-PROOF RS 2.2K J 1W		
VR1	3C		R10-5021-05	POTENTIOMETER(100K)VOLUME CONT		
K1		*	S51-2075-05	MAGNETIC RELAY		
D1 ,2			D5FB20*1	DIODE		
D3 ,4			E-102	CONSTANT CURRENT DIODE		
D5 ,6			HZS8.2S(B2)	ZENER DIODE		
D5 ,6			RD8.2JS(B2)	ZENER DIODE		
D7			E-102	CONSTANT CURRENT DIODE		
D8			HZS8.2S(B2)	ZENER DIODE		
D8			RD8.2JS(B2)	ZENER DIODE		
D9 ,10			HZS20S(B2)	ZENER DIODE		
D9 ,10			RD20JS(B2)	ZENER DIODE		
D11 ,12			1SS131	DIODE		
D11 ,12			1SS178	DIODE		
IC1 ,2		*	KAB01	IC(DRIVER,POWER)		
IC3 ,4			TA2030	IC(LO/HI SWITCHING)		
Q1 ,2			2SC2003(L,K)	TRANSISTOR		
Q3			2SC1845(F,E)	TRANSISTOR		

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KA-990EX

PARTS LIST

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Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Desti-nation 仕向	Re-marks 備考
Q4 ,5			2SA954(L,K)	TRANSISTOR		
Q6			2SA992(F,E)	TRANSISTOR		
Q7			2SA1124(Q,R,S)	TRANSISTOR		
Q8			2SC2632(Q,R,S)	TRANSISTOR		
Q9			2SA999(E,F)	TRANSISTOR		
TONE UNIT (X11-2472-71)						
109	2B		A33-0098-04	REFLECTOR		
D1 -9	3B	∗	B30-1206-05	LED (INPUT SELECTOR)		
D10	3B		B30-1012-05	LED(SLP-981C-50)COAX		
D11	3B	∗	B30-1206-05	LED (OPT)		
D12	3B		B30-1012-05	LED(SLP-981C-50)COAX		
PL1 -3	3C		B30-1212-05	LAMP(BLU)DIGITAL,ANALOG		
C1 ,2			C90-1335-05	NP-ELEC 4.7UF 50WV		
C3 ,4			CF92FV1H154J	MF 0.15UF J		
C5 ,6			CF92FV1H333J	MF 0.033UF J		
C7 -10			CC45FSL1H101J	CERAMIC 100PF J		
C11 -14			CF92FV1H105J	MF 1.0UF J		
C15 ,16			CK45FB1H561K	CERAMIC 560PF K		
C17 -20			CF92FV1H393J	MF 0.039UF J		
C21 -24			CE04KW1C220M	ELECTRO 22UF 16WV		
C25 -28			CF92FV1H684J	MF 0.68UF J		
C29 ,30			CE04KW1H2R2M	ELECTRO 2.2UF 50WV		
C31 ,32			C91-0168-05	POLYSTY 15PF K		
C33 ,34			CF92FV1H101K	MF 100PF K	E	
C35			CF92FV1H103J	MF 0.010UF J	E	
110	2B		J11-0111-05	CLAMPER		
L1 ,2			L40-1021-14	SMALL FIXED INDUCTOR(1.0MH,K)		
R39		∗	RS14KB3A272JTE	FL-PROOF RS 2.7K J 1W		
R40		∗	RS14KB3A392JTE	FL-PROOF RS 3.9K J 1W		
R41 ,42		∗	RS14KB3D181JTE	FL-PROOF RS 180 J 2W		
VR1	3C		R06-5166-05	POTENTIOMETER(200KM)BALANCE		
VR2 ,3	3B		R06-2018-05	POTENTIOMETER(5KB) BASS,TRABLE		
S1	3B	∗	S42-6023-05	MULTIPLE PUSH SWITCH(TAPE,CD)		
S2	3B	∗	S42-3109-05	MULTIPLE PUSH SWITCH(DAT)		
S3	3B		S42-3108-05	MULTIPLE PUSH SWITCH(DAT,CD)		
S4	3B		S42-2161-05	MULTIPLE PUSH SWITCH(MODE)		
S5 ,6	3C		S40-2351-05	PUSH SWITCH (SUBS,DIGI,ANG)		
S7	3C		S40-4074-05	PUSH SWITCH (LINE STRAIGHT)		
S8	3C		S40-2351-05	PUSH SWITCH (MUTING)		
S9	3C		S40-4074-05	PUSH SWITCH (LOUDNESS)		
D13			1SS131	DIODE		
D13			1SS178	DIODE		
D14			HZS10N(B)	ZENER DIODE		
D14			RD10ES(B)	ZENER DIODE		
D15			HZS11N(B)	ZENER DIODE		
D15			RD11ES(B)	ZENER DIODE		
IC1			NJM2041D-D	IC(OP AMP X2)		
Q1 ,2			2SC2320(E,F)	TRANSISTOR		
Q1 ,2			2SC945(A)(Q,P)	TRANSISTOR		
Q3			2SC2021F	TRANSISTOR		
SUB-CIRCUIT (X13-5810-00)						
L1 -5			L33-0329-05	CHOKE COIL		

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KA-990EX

SPECIFICATIONS

Power Output

110 watts per channel minimum RMS, both channels driven at 8 ohms from 20 Hz to 20,000 Hz with no more than 0.004% total harmonic distortion

Maximum Continuous Power Output (DIN) 1 kHz at 4 ohms .... 150 W
Maximum Continuous Power Output (DIN) 1 kHz at 8 ohms .... 120 W
Maximum Continuous Power Output (IEC/NF) from 63 Hz to 12,500 Hz 0.7%
Total Harmonic Distortion at 8 ohms .... 120 W + 120 W
Dynamic Power .... 125 W per channel at 8 ohms
235 W per channel at 4 ohms
315 W per channel at 2 ohms

Total Harmonic Distortion
LINE input to SPEAKER output
(20 Hz-20,000 Hz) : 0.004% at rated output power at 8 ohms
(20 Hz-20,000 Hz) : 0.003% at 1/2 rated output power at 8 ohms
(1 kHz) : 0.0006% at rated output power at 8 ohms
Intermodulation Distortion (60 kHz:7 kHz = 4:1) : 0.004% at rated output power
Damping Factor : 1,000 (50 Hz at 8 ohms)
Power Bandwidth : 5 Hz to 50 kHz at 0.04% T.H.D., 8 ohms
Frequency Response
LINE to SPEAKER : 1 Hz to 80 kHz, +0 dB, −3 dB
PHONO "RIAA" Response PHONO : 20 Hz to 20 kHz, ±0.3 dB
Input Sensitivity/Impedance
PHONO (MM) : 2.5 mV/ 47 kohms
PHONO (MC) : 0.2 mV/100 ohms
TUNER/AUX/TAPE : 150 mV/ 47 kohms
Signal to Noise Ratio (IHF-A) (IHF'66)
PHONO (MM) : 87 dB (2.5 mV)
PHONO (MC) : 70 dB (0.2 mV)
TUNER/AUX/TAPE : 108 dB (150 mV)
Signal to Noise Ratio (IHF-A)
PHONO (MM) : 78 dB
PHONO (MC) : 74 dB
TUNER/AUX/TAPE : 82 dB
Signal to Noise Ratio Unweighted: 50 mW (DIN) (Europe only)
PHONO (MM) : 58 dB
TAPE/AUX/TUNER : 60 dB
Channel Separation (at 1,000 Hz) (DIN) (Europe only)
PHONO (MM) (Terminated with 2.2 kohms) : 53 dB
AUX (Terminated with 47 kohms + 250 pF) : 58 dB
Phono Maximum Input Level (PHONO to TAPE REC)
(MM) : 200 mV, (RMS) T.H.D. 0.004% at 1 kHz
(MC) : 15 mV, (RMS) T.H.D. 0.004% at 1 kHz
Output Level/Impedance
TAPE REC : 150 mV/330 ohms
Phono Frequency Response : RIAA standard curve ±0.3 dB (20 Hz to 20 kHz)
Tone Control
BASS (at100 Hz) : ±10 dB
TREBLE (at 10 kHz) : ±10 dB
Loudness Control (at −30 dB Volume Level) : 9 dB at 100 Hz
Subsonic Filter : −6 dB/Oct. at 18 Hz

GENERAL

Power Consumption : 270 W
Dimensions : W 440 mm (17-5/16")
H 171 mm (6-3/4")
D 441 mm (17-3/8")
Weight (Net) : 15.5 kg (34.1 lb)

Kenwood follows a policy of continuous advancements in development. For this reason specifications may be changed without notice.

Kenwood poursuit une politique de progrès constants en ce qui doncerne le développement. Pour cette raison, les spécifications sont sujettes à modifications sans préavis.

Kenwood strebt ständige, Verbesserungen in der Entwicklung an. Daher bleiben Änderungen der technischen Daten jederzeit vorbehalten.

Note:

Component and circuitry are subject to modification to insure best operation under differing local conditions. This manual is based on, the Europe (E) standard, and provides information on regional circuit modification through use of alternate schematic diagrams, and information on regional component variations through use of parts list.

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